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# SURGICAL OBSERVATIONS

ON

# INJURIES OF THE HEAD;

AND ON

# MISCELLANEOUS SUBJECTS.

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# SURGICAL OBSERVATIONS.

## On Injuries of the Head.

### SECTION I.

WHEN the Members of the Academy of Surgery in France, and Mr. Pott in England, severally inculcated to the surgeons of their respective countries, the propriety and necessity of trephining the cranium under various circumstances consequent upon injuries of the head, they probably recommended a too free and frequent performance of that operation. Such appears to be the opinion of many respectable writers who have published since their time; particularly of M. Desault of Paris, Mr. Dease of Dublin, and Mr. John Bell of Edinburgh. But although these writers unite in censuring the frequency of the practice, they are very far from being agreed in other respects; and many material points seem to me to require still further elucidation.

Believing that the observations, which I have had an opportunity of making at St. Bartholomew's Hospital, enable me to throw some light on this important and intricate subject, I am induced to submit to the public a short account of several cases that occurred there, and the inferences which I drew from them.

The difficulties connected with this part of surgery are sufficiently proved by this circumstance, that, notwithstanding it has at all times excited the attention of surgeons of the greatest talents, and possessing the most extensive field for observation, much difference of opinion still subsists, and the practice that ought to be followed in particular cases yet remains a matter of dispute. It is not, indeed, probable, that any part of medical science can in a short time receive all the improvement of which it is capable; for, in proportion as we advance in knowledge, we are led to remark many circumstances in the progress of a disorder, which had before passed without notice, but which, if known and duly attended to, would clearly point out to us the nature and remedy of the complaint. Hence, the records of former cases are of much less value, as the symptoms about which we are now anxious to inquire, have in them been entirely overlooked.

I was led to this remark by reading the Works of Hildanus, Wepfer, Du Quesnay, and others, wherein are to be found a number of interesting cases, which I have been precluded from mentioning, as the nature of them cannot be exactly ascertained in consequence of this deficiency.

Although I have been for many years attentive to the treatment of persons who had suffered injuries of the head, and also to the examination of the parts after death, where the case has terminated fatally; I still perceive so many circumstances which require investigation, that I entertain no hope of ever being able to obtain, from my own experience, all the information which is wanted. I hope, however, that the hints offered in this essay may have the effect of inducing surgeons to pay a closer attention to cases of this kind, and that thus, by their united observations, the public may at length become possessed of

that knowledge, which the labours of an individual could never supply.

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In the accounts which we have of the former practice in France, it is related, that surgeons made numerous perforations along the whole track of a fracture of the cranium; and, as far as I am able to judge, without any very clear design. Mr. Pott also advises such an operation, even with a view to prevent the inflammation and suppuration of the *dura mater*, which he so much apprehended. But many cases have occurred of late, where, even in fractures with depression, the patients have done well without an operation. To confirm the accounts that have been given of such cases, and by this means to counteract, in some degree, the bias which long accustomed modes of thinking and acting are apt to impress on the minds of practitioners, I shall relate the histories of five cases, that occurred at St. Bartholomew's Hospital in the space of twelve months; and afterwards offer a few remarks upon the subject. The principal circumstances only of each case are related; for, as many examples of the same kind are to be found in various surgical books, a minute detail of particulars seems to be unnecessary.

## *Cases of Fracture of the Cranium with Depression, which terminated favourably, although no Operation was performed.*

### CASE I.

A woman, about forty years of age, was admitted into the hospital for a wound on her head. About a week before she applied for advice her husband

had knocked her down with a brass candlestick. She was stunned by the blow, and lay for some time senseless; but, on recovering, she felt no other inconvenience than the soreness occasioned by the wounded integuments. She had suffered some slight indisposition since the accident.

On examining the head, the right parietal bone was found denuded about two inches in extent; a fracture of the same length was also to be felt; and the bone on one side of the fracture was depressed about the eighth of an inch.—She remained in the hospital a fortnight, without any bad symptom occurring, and was then, at her own desire, discharged, although the wound was not perfectly healed.

CASE II.

A boy, about twelve years old, received a kick from a horse in Smithfield, which stunned him; and he was immediately brought to the hospital. The integuments of the forehead were divided by the injury, and the lower part of the os frontis, and superciliary ridge of the frontal bone depressed at least a quarter of an inch below its original level; the depressed portion measuring about an inch and a half in length.

It is obvious that the bone could not be thus depressed without a fracture of some part of the basis of the skull occurring at the same time, on which account the case might be considered as more dangerous.—In less than two hours he had recovered from the immediate effect of the blow, being at that time perfectly sensible. Fourteen ounces of blood were taken from his arm; his bowels were emptied by a purge; and saline medicines, with antimonials, were directed to be given. He went on tolerably well for two days, at the end of which time, evident

symptoms of considerable irritation of the brain took place. He now complained of pain in his head; slept little; and, when dozing, often started, or was convulsed in a slight degree. To remove these symptoms, he was bled twice, took opening medicines occasionally, was kept quiet, and without light, and was allowed only a spare diet. By continuing this plan for about three weeks, he perfectly recovered.

CASE III.

A man between thirty and forty years of age, received a blow on the forehead from a brick thrown at him, by which the frontal bone was fractured about half an inch above the orbit: the fracture measured two inches in length, and the upper portion of the bone was depressed about the eighth of an inch. He was not even stunned by the blow, and walked to the hospital without assistance, complaining only of soreness in the wounded integuments. Sixteen ounces of blood were immediately taken from his arm; he was confined (much against his inclination) to a scanty and liquid diet, and was purged every second day.—This patient did not experience any illness; and the wound soon healed.

CASE IV.

A boy, about thirteen years old, had a fracture, with depression, of part of the temporal and parietal bones. By similar treatment, he also escaped without any material ill consequences; but in this case, part of the injured bone exfoliated.

CASE V.

A girl, thirteen years old, had a considerable fracture, with depression of the left parietal bone. She was not brought to the hospital until ten days after the accident. When admitted, she was feverish, had pain in her head, and the little sleep she got was very much disturbed: but, by the use of bleeding, with antiphlogistic medicines and regimen, she soon got perfectly well.

The cases above related are not offered to notice on account of any striking peculiarity attending them, but merely to show that such are not unfrequent, as they all occurred within the course of a year. From amongst a great number of similar cases, I shall select the two following, as the symptoms attending them were more violent than ordinary.

CASE VI.

A lad, seventeen years of age, had his head pressed between a cart-wheel and a post; by which accident the scalp on both sides was turned downwards, so as to expose the lower half of the parietal bones, the squamous part of the temporal, and also part of the frontal and occipital bones; about a quarter of the cranium being thus completely denuded. The periosteum was in several places stript off from the skull, the scalp much bruised, and the posterior and inferior angle of the left parietal bone was beaten in. The visible part of the depressed portion was an inch in length, and more than an eighth of an inch below the level of the cranium; but the fracture extended along the squamous part of the temporal bone towards the basis of the skull: it could not, however, be traced, as the temporal muscle had

not been removed from that part by the injury.—The scalp being cleansed was replaced, retained in its situation by slips of sticking-plaster, and a slight pressure by bandage was applied. The boy was perfectly sensible, his pulse regular, and not quickened. He had bled considerably from the temporal artery, which had been divided by the accident: eight ounces of blood were, however, taken from his arm; and some purging medicine was administered next morning, which procured three or four stools.—The next day *(Friday,)* his pulse beat nearly 120 in a minute; his skin was hot and dry; and he complained of pain in his forehead. Twelve ounces of blood were taken away, and four grains of pulvis antimonialis ordered to be given three times a day. On *Saturday*, the former symptoms still continued, and were rather increased. The antimonial powder made him sick, or at least increased his disposition to be so. Fourteen ounces more of blood were taken from him; the vibratory feel of his pulse not being altered until that quantity was taken away: the blood, on standing, appeared very buffy. His skin, notwithstanding all this, still remained extremely dry; some antimonial wine was given, which produced vomiting. On *Sunday*, his pulse was evidently lowered by the evacuations he had undergone, but it was still quick, and sufficiently strong. The pain of the head remained as before. Having a sufficient number of stools, and the sickness still continuing, the antimonial powder was omitted. He was bled, however, in the vena saphena, and his feet and legs were afterwards immersed in warm water; during which, he, for the first time, perspired copiously. A blister was also applied to his neck.—The scalp united, with only a trifling suppuration over the fractured part of the bone; and to this ready union, the lowering plan, by preventing inflamma-

tion, seems very materially to have contributed. The matter collected over the fracture was discharged by a puncture, and the boy got well.

CASE VII.

A lad, eighteen years of age, had the squamous part of the temporal bone beaten in; the fracture ran horizontally, about a quarter of an inch above the zygoma, and could be distinctly traced with the finger, introduced through the torn scalp and temporal muscle, for two inches. The upper part of the bone was depressed about one-eighth of an inch; and it was impossible to trephine below the fracture in order to elevate the depressed portion. The lad had recovered from the immediate stunning occasioned by the injury; nor was there any symptom that indicated material derangement of the functions of the brain from the pressure which it sustained. He was bled largely, and took a purging medicine, and was moderately well on the following day. On the second morning he was again purged; and when I saw him at noon nothing materially wrong appeared; but when I came to the hospital at eight in the evening I found he had gradually become delirious, and that he then could scarcely be kept in bed. His skin was hot, and his pulse frequent and strong. These symptoms could be attributed to nothing but inflammation of the brain; he was therefore immediately and largely bled. He now became quiet and manageable; but the next morning his replies to all questions were incoherent, his pulse frequent, his skin hot, and his tongue dry. The bleeding and purging were repeated, and at night a blister was applied to his neck. On the following morning he was sleeping and feeble, but his answers were rational; as the frequency and fulness of his pulse increased in the

evening, he was again bled. The inflammation of the brain was now subdued, and the patient gradually recovered. The wound healed without any exfoliation of bone, and when he was discharged from the hospital there was not the most trivial circumstance which could induce us to suspect that the brain had sustained any injury from the accident. His sleep was sound and undisturbed, and the sudden motion of his head in any direction occasioned no giddiness or inconvenience.

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It appears very clearly, I think, from these cases, as well as from a great number of others to be found in books, that a slight degree of pressure does not derange the functions of the brain, for a limited time after its application. That it does not do so at first is very obvious; as persons are often perfectly sensible, and free from head-ach and giddiness immediately after the injury. Whether it may not produce such an effect at some remote period, is not so easily determined, since this cannot be ascertained but by a continued acquaintance with the persons who had received the injuries. All, however, whom I have had an opportunity of knowing for any length of time after the accident, continued as well as if nothing of the kind had ever happened to them. In Mr. Hill's Cases in Surgery, two instances of this sort are related; and Mr. Hill knew both the patients for many years afterwards, yet did not perceive any inconvenience to arise. It deserves to be mentioned too, that one of the patients was a sailor, and therefore, probably, led a life of irregularity as well as of exertion. The result of cases of

this kind, which I have met with in authors, does not lead to the apprehension of any future mischief: nor is it easy to conceive that the pressure, which caused no ill effects at a time when the contents of the cranium filled its cavity completely, should afterwards prove injurious when they have adapted themselves to its altered size and shape. Severe illness, indeed, does often intervene between the receipt of the injury and the time of its recovery; and many surgeons might be inclined to attribute this to pressure; but it equally occurs where the depressed portion is elevated; several instances of which I shall have occasion to relate, and many others are to be met with in authors. This is a circumstance which nothing but very extensive experience can show in a true light. If, for instance, a surgeon who was prepossessed with the opinion that elevation of the bone is necessary in every instance of depressed cranium, should have acted upon this opinion in the first, third, fourth, and fifth cases, and afterwards have employed proper evacuations, his patients might, perhaps, have had no bad symptoms, and he would naturally have attributed their well-doing to the mode of treatment which he had pursued: yet these cases did equally well without an operation. If the same surgeon had been witness to the disturbance which arose in the second, sixth, and seventh cases, he would, without doubt, have attributed them to the continuance of pressure made by the bone; yet these cases also did well by medical treatment only: and when the symptoms which come on thus, are of the inflammatory kind, they may generally be removed by the same means. Many cases also are to be met with in books, and some are related in the subsequent part of this Essay, where not only great but even fatal mischief ensued, notwithstanding the brain had been relieved from

pressure at an early period. Another surgeon, prejudiced against the use of the trephine, might, with equal injustice, consider the mischief, which ensues in certain cases, as entirely owing to the operation.

The degree of pressure, which the brain can sustain without great injury to the system, may probably vary according to the disposition of that organ to be affected by it, the suddenness of its application, and the direction in which it is made: and although it must be very difficult to obtain any precise knowledge on this subject, yet there is great reason to believe that the brain can bear more pressure without injury to it, than was formerly supposed. The first of these circumstances seems evident; for in some persons a slight pressure produces severe symptoms; whilst, in others, a much greater degree is borne without inconvenience. We can rarely judge of the effects of pressure when any part of the cranium is beaten in by a blow; for in that case the shock generally occasions stupefaction. Internal hemorrhages, perhaps, afford us the best criterion whereby to determine the effects of pressure on the brain. The eighth case will serve as an illustration of this remark, where it appears that a considerable hemorrhage must have taken place before it deprived the patient of his faculties; for he walked home, undressed himself, and went to bed, after the trunk of the middle artery of the dura mater had been ruptured. In cases of apoplexy also, the hemorrhage is generally very large before it produces those consequences which destroy life.

The authorities quoted by Morgagni, as well as his own observations, show that people may recover from apoplexy even after a considerable effusion of blood has taken place. But as the records of such cases are not common, and as it appears to me that further confirmation of them would be highly use-

ful, I have obtained permission of Mr. Wilson to mention a remarkable case of this kind, which occurred to his notice.—A gentleman fell down suddenly, and remained for some time in that lethargic state which is usual in apoplectic cases; but afterwards gradually recovered his faculties both of mind and body, and continued to exercise them very perfectly for two years, when a second attack of the same kind took place, and destroyed him. Upon opening the head, the cause of his death became evident; for a large quantity of blood was found in the ventricles, and at the basis of the cranium. But what seemed particularly worthy of attention, was a cavity in the right hemisphere of the brain, extending from the front to the back part of the cerebrum, being more than four inches in length, and more than an inch in breadth. Within this cavity were contained flakes of coagulated lymph, and a bloody-coloured fluid, which Mr. Wilson, whose abilities and accuracy of observation entitle his opinion to the fullest credit, was convinced were the remains of the blood extravasated at the first attack.

I also examined the brain of a gentleman, with whom, for the last five years of his life, I was intimately acquainted. When I first knew him, he was slowly recovering from a severe fit of apoplexy, which had paralyzed the left side of his body. Though he could not raise his left arm to his head, nor move his left thigh and leg with freedom, yet he walked about moderately well, and could work in his garden. Every winter he was subject to fits of the gout, and every summer to such a plethoric and inflammatory state of the vessels of the head as to threaten another apoplexy. He was once immediately and most completely relieved from very distressing feelings from the latter cause, by the abstraction of ten ounces of blood from the temporal artery. The

last fit of apoplexy, which I have mentioned, was the third, with which he had been afflicted. The first affected his speech, the second his right arm, and the third produced the effects which I have related. His bodily and mental powers remained however very vigorous, even during the five last years of his life. On dissection three apoplectic cells were found. One was situated superficially in the left lobe of the cerebellum, one in the left hemisphere of the cerebrum, and one, which had probably been the cause of the last and greatest degree of paralysis, in the middle of the right hemisphere of the brain. Nothing but the membranes, which immediately invest the brain, covered the effused substance, which had become of a gelatinous nature. I do not exaggerate, when I say, that this cavity was large enough to have held six ounces of blood.

Though a slight degree of pressure does not immediately affect the functions of the brain, yet it may act in another way;—it may excite inflammation of that organ, as it does of other parts of the body. Its power in this respect, however, will probably lessen by the part becoming accustomed to it; and the cases on record, where fractures with depression have done well, as well as those of recovery from apoplexy, are proofs, that the cause which in the first instance was injurious by its pressure, may continue to exist without inconvenience. Such cases ought surely to deter surgeons from elevating the bone in every instance of slight depression, since, by the operation, they must inflict a further injury upon their patients, the consequence of which it is impossible to estimate. From all, therefore, that I have learned from books, as well as from the observations I have made in practice, and from reasoning upon the subject, I am disposed to join in opinion with those surgeons, who are against trephining in slight depressions of the

skull, or small extravasations on the dura matter. In the latter, it is probable the compressing cause will soon be removed by absorption; and in the former, according to the observations of Mr. Hill* and Mr. Latta,† the bone will regain its natural level if the subject be young. In adults, however, and especially in persons of advanced life, this circumstance cannot be expected; so that in them the accommodation of the parts to each other, necessary for preventing future mischief, must be effected by a corresponding alteration in the form of the brain.

A circumstance, however, frequently occurs, that may render the surgeon doubtful as to what course he ought to pursue; this happens when, at the same time that the skull is slightly depressed, the patient labours under the effects of concussion. The circumstances, which generally serve to distinguish those two injuries, will be noticed hereafter. At present it is only necessary to observe, that, as the effects of the latter gradually abate, a little delay will enable the surgeon to decide upon the nature of the mischief, and take his measures accordingly. Where the patient retains his faculties, nothing farther is necessary than a continuance of the antiphlogistic plan; and should any inflammation afterwards take place, the same means, employed in a degree proportioned to the urgency of the symptoms, will in most instances be successful without elevating the bone. This happened in four of the six foregoing cases, which are related without any view to this particular point.—But if, from a peculiar disposition of the brain to be affected by pressure, the torpor of that organ should continue; or if, after inflammation of the brain has taken place, the pressure should

* Cases in Surgery, p. 113.

† Pract. Syst. of Surgery, vol. ii. p. 172.

then appear to be particularly injurious, the elevation of the bone ought not, I think, to be deferred. And from some of the cases related by Mr. O'Halloran, in the fourth volume of the Transactions of the Royal Irish Academy, it appears that this operation, if not too long delayed, will give effectual relief under such circumstances.

The older surgeons certainly trephined unnecessarily, in consequence of their belief, that the brain was an organ of so delicate a structure, that the least degree of pressure would be highly injurious; whilst others, from having witnessed the frequent ill success attending the operation, and from having observed that many patients had recovered unexpectedly when it was omitted, seem inclined, too generally, to reprobate the practice. Under these circumstances, it appeared proper, by the recital of instances, to show what kind of cases would probably do well without having recourse to it. With this view I have laid before the public the preceding cases; and I wish, in conclusion, to offer in this edition, a few additional remarks on the circumstances which would influence my conduct with regard to the immediate performance, postponement, or omission of the operation.

The preceding cases show, that in general there is no necessity for trephining in such fractures of the skull as occurred in them. It may further be stated as an argument against the hasty performance of this operation, that it is likely to aggravate the inflammation of the brain, which in the majority of cases comes on in consequence of the injury.

If it can be shown, that injury done to the scalp and bone, where there is no fracture or concussion, may sometimes be productive of inflammation of the brain, it would then follow, that the injury inflicted on these parts in the operation of trephining would

probably aggravate the inflammatory symptoms, which are to be expected to succeed to all violent blows on the head. To show that disorder of the brain is likely to take place from its sympathy with the parts which contain that organ, I relate the following cases.

### CASE VIII.

A coachman standing on a small ladder to clean the top of a carriage, slipt and fell, with his head against the window, which was drawn up at the time. The window being thus broken, the sharp edge of the glass divided and turned down the scalp to a considerable extent from off the parietal and frontal bones. In this state he came to my house, with the arteries bleeding profusely. I tied two of them, replaced the scalp, and sent him to the hospital: the next day he did not appear much indisposed; but after another day or two had elapsed, he suffered much from inflammation of the scalp, part of which was even in a sloughy state. The patient had, at the same time, violent fever, and great disorder of his stomach and bowels. Small doses of calomel and gentle aperients were given for the latter affections; and he also took saline, and other febrifuge medicines. After about a week had elapsed, the scalp assumed a much better appearance, the inflammation having subsided, and the sloughs being detached. Nevertheless, his febrile state became aggravated, and a kind of delirium and symptoms indicating inflammation of the brain, came on, which venesection did not subdue. The patient died, and his head being examined, it was found, that the brain and its membranes had undergone considerable inflammation, which, from the degree of effusion between the tunica arachnoidea and dura mater, and between

it and the pia mater, appeared to have lasted for a considerable time.

CASE IX.

A man had the scalp bruised and torn down from off the frontal bone by the wheel of a cart. He was not stunned at all by the accident. The bruised scalp mortified and the bone was left bare. He remained in the hospital waiting for exfoliation, and as he had no illness, but little attention was paid to him. After about two months, however, he became weak, and ultimately delirious, and died; on examination, an abscess containing about one ounce and a half of pus was found in the front lobe of the cerebrum, beneath the dead bone, and full half an inch from the surface.

If then irritation and inflammation of the scalp and bone may sometimes produce similar affections of the brain and its membranes, this very circumstance affords an argument for performing the operation in a certain description of cases, in which, indeed, its necessity may not be immediately apparent. I allude to those cases in which, though the bone be but slightly depressed, and may not occasion decisive symptoms of pressure, yet it may be broken into many pieces, and the scalp be so bruised, or otherwise injured, as not to be likely to unite by adhesion. Inflammation and suppuration must now ensue in the scalp, and some of the pieces of the bone will probably perish, and must be detached by tedious processes, which may induce disease in the subjacent membranes of the brain, as well as in that portion of the organ which they invest. I have therefore deemed it necessary to trephine in some cases of this description; and I think it will be useful to relate briefly one case of this kind. It will also serve

as a contrast to that which immediately succeeds to it.

### CASE X.

A drunken woman was knocked down on Blackfriars Bridge, by a blow with a cane, which had a round leaden head, about an inch in diameter. A circular piece of bone was beaten in to the depth of a quarter of an inch, and starred or broken into many fragments. By dividing the scalp, I had the power of reflecting a portion of the integuments, so that I could trephine the bone, and remove the shattered and depressed pieces. I also took out a clot of coagulated blood as large as a walnut. The wound was closed by sticking plaster, a compress laid over the part, and bound on by sticking-plaster. The patient was largely bled, and a dose of purgative medicine was given.

It was difficult to determine whether the sleepy and stupid state of the patient was chiefly the effect of the injury or inebriety. She complained loudly during the operation. The next day, when the students of the hospital wished to examine whether the dressings were displaced or not, she refused to permit them; but on my entering the ward, she said, ay, now he is come, you may examine if you please. I need only add further, that a treatment calculated to prevent and control inflammation was strictly persevered in, and that the patient shortly became perfectly well.

### CASE XI.

June 3, 1802. A coachman, twenty-three years of age, was thrown from his box. The middle of the anterior edge of the right parietal bone was fractured,

and a piece about the size of a sixpence was slightly depressed. He soon recovered from the stunning occasioned by the fall, and did not come to the hospital till the succeeding day. As he was perfectly well, he was but slightly bled, and no bad consequences of this injury appeared for two months. At this time he came again to the hospital, complaining of spasms in his left arm. The wound, which was not yet healed, being examined, the depressed bone was found to be loose, and was removed, which alleviated the spasms. Soon afterwards a portion of the external table of the skull also came away. In the middle of September his health seemed much deranged, and he continued to get weaker till the middle of October. The dura mater had gradually become protuberant, and covered with a fungus; it at last gave way, and coagulated blood was discharged, mixed with detached pieces of the substance of the brain. The left arm had now lost its sensation, though the patient could feebly direct its motions. On the 17th of October the patient became very ill, and much bloody serum was discharged from the wound. He was delirious during the night, but on the next day understood all questions proposed to him; blood and brain were discharged through the wound. On the evening of the 19th he died. There was found a vacancy in the membranes of the brain, opposite to the deficiency in the bone, through which the effused blood and injured brain had been discharged. In other respects these membranes were perfectly sound. The whole right hemisphere of the brain seemed to be reduced into a pulpy and fetid mass, composed of a mixture of blood and brain; except that the cortical substance, to the depth of about half an inch, remained sound. This large cavity communicated with the left ventricle under the fornix.

It may be further stated as an argument against the immediate performance of the operation of trephining, in cases where its necessity is dubious, that it deprives the brain and its membranes of that natural support which they receive from the bone. Under these circumstances, when inflammation comes on, the volume of the parts contained in the cranium, will be so considerably augmented by the preternatural distention of their vessels, and subsequent effusion of fluids, as to be protruded up into one aperture. The dura mater is likely to give way, and the pia mater becoming exposed, will be more subject to inflammation. It now sustains the pressure which was formerly supported by the dura mater, and in its turn ulcerates, and the brain will protrude and produce fungous excrescences. These circumstances are more particularly likely to happen in children; in them, indeed, the dura mater is so firmly connected with the bone, that it is rarely separated by accidental violence, and it is even difficult to tear off the bone, when it has been perforated by the trephine. The argument against immediately trephining the cranium, unless urged to it by great necessity, applies, therefore, more strongly to cases of children than to similar accidents occurring in adults. These remarks show the necessity for the most copious evacuation after the operations of the trephine, in order to prevent as much as possible the augmentation of the bulk of the contents of the cranium by subsequent inflammation and effusion, and which is productive of the prejudicial effects above stated.

With a view to obviate these, the plan of treatment instituted by Mr. Mynors of Birmingham, highly deserves imitation. Having, by a simple division of the scalp, gained room for the application of the trephine, and removal of the depressed bone,

he closed the wound attentively, and the scalp united by adhesion to the dura mater on which it lay. A gentle pressure, such as would give to the membranes of the brain that support which they were wont to receive from the bone, seems also likely to be useful.

There are, doubtless, some depressions of the skull that it would be absurd not to elevate by an immediate operation, for in them the pressure on the brain would of itself be productive of fatal consequences. The arguments which I have stated against the immediate performance of the operation, apply therefore, in my opinion, only to dubious cases; to those in which, perchance, upon the subsidence of the inflammatory symptoms, the pressure may be found not to be so great, but that it may be borne without detriment, though there is a risk that it may be detrimental.

Under these circumstances, by postponing the operation, we avoid the aggravation of the inflammatory symptoms which immediately succeed to the injury, and those consequences which arise from leaving an aperture in the cranium into which the contained parts are likely to be protruded. I say, by postponing the operation, because, if upon the subsidence of the inflammatory symptoms, the pressure by itself is found to produce prejudicial effects, we are still at liberty to perform it, nor is it likely to be attended with that violent inflammation which arises from the injury and operation conjointly. There must be dubious cases; for a degree of pressure which might be borne in one person without inconvenience, may, in another, occasion a torpid state of the brain, or other symptoms requiring its removal. Mr. O'Halloran's cases appear, therefore, to me very valuable, because they show that the

operation of trephining will succeed under these circumstances; and, I know, that it has been twice performed of late in London with perfect relief of those symptoms for which it was required, and without being followed by any inflammation which was not readily controlled.

## SECTION II.

### *Injuries of the Head attended with Extravasation of Blood upon the Dura Mater.*

In the three following cases the skull was broken, and depressed at the part which covers the middle artery of the dura mater, by which means that vessel was lacerated. The attention of surgeons has not been sufficiently directed to this event, although it is of the utmost importance; for the life of the patient might often be saved, if the nature of the accident were known, and the bone speedily perforated.—These cases likewise display, in a very striking manner, some of the effects caused by great pressure on the brain.

### CASE XII.

A man was knocked down by the iron hooks of a crane, which fell upon his head from a considerable height. He was stunned at first, but soon recovered his powers of mind and body so far as to walk home, undress himself, and go to bed. A surgeon was sent for, who, on his arrival, found the man senseless, and in a deeply apoplectic state. The patient was immediately brought to St. Bartholomew's Hospital, when the functions of life seemed nearly suspended, as he was almost without sensation, his breathing being slow, irregular, and stertorous, with an unequal, intermitting pulse, and cold extremities.—The scalp covering the right parietal bone was wounded; and on dividing it more extensively, a fracture with depression was discovered, running

obliquely across the anterior and inferior angle of the parietal bone, over the temporal bone, and extending to the basis of the cranium, before the mastoid process. Several perforations with the trephine were made along the course of the fracture, and the depressed portion taken away. A surprising quantity of congealed blood was found upon the dura mater; the coagulum being not less than an inch and half in thickness, and six or seven inches in circumference. On the removal of this coagulum, the brain, which had been indented by its pressure, remained in the same state as before, nor did it ever regain its original level; so that the patient experienced but little benefit from the operation, and he died about twelve hours after receiving the blow.

The dura mater, in this case, was not torn through in any part; so that the blood could not have come from any vessel within that membrane. The source of such a profuse hemorrhage, however, could not be doubtful, when it was known that the fracture crossed, and had probably wounded, the principal artery of the dura mater; yet that vessel did not bleed after it was exposed.

### CASE XIII.

A boy, about fourteen years of age, fell from a scaffold near two stories high, and pitched on his head. When brought from Islington to the hospital, he appeared to be almost in a dying state. The anterior inferior angle of the parietal, and part of the frontal bones, were found depressed. A piece of the cranium being taken out with the trephine, I discovered beneath it a large quantity of coagulated blood; I therefore made the next perforation nearer to the trunk of the principal artery of the dura mater, from which I concluded that this hemorrhage

had taken place. Having gently removed some of the coagulum, and introduced my finger into the aperture which had been made, I passed it as far as the second joint, before I could touch the dura mater. Fluid arterial blood now gushed out in such quantities as to keep the bone covered on which I was next to trephine. I ran no risk, however, in performing the operation; for the dura mater was depressed so much that it could not be injured. But to guard against even the possibility of such an accident, I introduced my finger between the dura mater and skull, and then perforated the bone with the trephine. Having thus removed a third piece, which was directly over the principal artery, I took out about four ounces of coagulated blood; upon which the dura mater quickly rose to its original level, and the hemorrhage from the wounded artery ceased. I now entirely removed the depressed portion of bone, and thus uncovered all the dura mater which had been detached; so that I could distinctly feel its connexion with the cranium all round. This satisfied me that no more extravasated blood was left behind.—The lad, who at the beginning lay quite insensible, with a feeble, intermitting pulse, and laborious interrupted respiration, became restless, and expressed sensations of pain towards the latter part of the operation. Being now asked, how he found himself? he replied, very well; Whether his head ached? he answered, no; If he was sure that he felt no pain? he said he was sure, and wished we would leave him alone.—I now took twelve ounces of blood from his arm, and he was put to bed, where he passed the night quietly. The next morning his bowels were completely emptied by a purge; and saline medicines, with antimony, were given, so as to keep the skin in a gentle state of perspiration. During the day he was sleepy, and

lay quiet; answered questions very rationally, and complained of pain and giddiness in his head.—The third day he was disturbed, and less rational. Eight ounces of blood were taken from him, and a blister was applied to his neck. These means relieved him greatly, and he became quite tranquil and collected.—On the sixth day, symptoms of irritation again took place, and were again relieved by similar treatment. The dura mater had granulated, and the whole wound looked healthy. Every thing went on remarkably well until the fifteenth day, when the patient was seized with rigor and pain in his head, and the healthy aspect of the wound was also changed. The following day, there was perceived, in the middle of the exposed dura mater, an aperture through which a protrusion of the brain arose, covered by the pia mater, which retained its natural appearance. In less than twenty-four hours this tumor increased to the size of an orange; its surface was dark-coloured, and irregular, and the pia mater no longer distinguishable. The following morning the boy died; and his friends had removed the body from the hospital before I knew of his decease.

I regretted very much that I could not examine the nature of this fungus or hernia cerebri, as it was a phenomenon which I had more than once contemplated with surprise, and the nature of which I was afterwards fortunately enabled to ascertain.

### CASE XIV.

A man was knocked down in Smithfield by a brick-bat, thrown at him by some villains against whom he had appeared as evidence upon a trial. He was immediately brought to the hospital; but in a state of profound apoplexy.—The right side of the frontal bone, and the lower part of the parietal, were

beaten in; the area of the depressed piece being two inches in diameter. After making three perforations in the circumference, I was enabled to remove the depressed portion. I then took out a large handful of coagulated blood, which lay upon the orbitary process of the frontal bone, and had so pressed back the anterior lobe of the brain, that I could, with my finger, touch the transverse spinous process of the sphenoid bone. The brain now rose slowly, in consequence, I suppose, of the blood gradually finding its way through the compressed vessels; and the man began to show signs of returning sense.—He was bled, and his bowels were emptied by a purge. The next day he was so far recovered as to give an imperfect account of the accident; but on the third day, he died convulsed.

On dissection, some blood was found between the dura and pia mater, and traces of inflammation appeared on the latter membrane.

Mr. Hill, of Dumfries, relates a case (the fifth,) where the artery of the dura mater was ruptured without either fracture or depression of the skull; and when he trephined a second time, four days after the accident, he found so large a coagulum of blood lying upon that membrane, as to make him afraid of removing it all at once: but on taking out a few ounces of it, the patient, who had hitherto lain in a state of apoplexy, looked up, on being spoken to, like one awakened from sleep,—knew, and named every body, and raised the arm belonging to the opposite side, which had been paralytic from the time of the accident.

In Mr. Latta's Surgery also, a similar case (as shown on dissection) is related, in which an uncommon slowness of the pulse, and coma without stertor, were the symptoms produced.

These cases show that a fracture of the skull is not likely to be followed by an equal degree of extravasation in every part, as the vessels connecting the dura mater to the cranium are, in most parts of that membrane, of a small size. If these are accidentally ruptured, a slight hemorrhage ensues, which soon stops, and only a thin stratum of coagulated blood is found when the bone is removed. But if the fracture happens in the track of the principal artery of the dura mater; if the trunk, or even a considerable branch of that vessel be torn, the hemorrhage will be profuse, and the operation of the trephine become immediately necessary to preserve the life of the patient. In the three cases that I have related, the operation was done very shortly after the accident: in the first case, the brain was so compressed that it did not regain its level; in the third, it rose slowly as the blood found its way through the vessels; and in the second, it rose quickly, and the functions of the brain were as quickly restored. It can scarcely be doubted, then, that if the operation had been performed in these cases as soon as it became necessary, when, perhaps, only one instead of many ounces of blood were poured forth from the torn vessel, the lives of the patients might have been preserved.

It is of great importance to distinguish accurately the nature of such cases; and the distinction is not difficult when there is an interval of sense between the blow and the stupor occasioned by the effused blood. In the first related case, for instance, the nature of the accident was made sufficiently evident by this circumstance. But though we are assured that the patient labours under the effects of compression, we cannot, in many instances, know the situation of

the compressing cause. In other cases, again, where there is no interval of sense after the accident, we are at a loss to determine whether the senseless state be the effect of compression or of concussion. Every surgeon must acknowledge that it would be a very desirable thing to ascertain when blood is effused between the dura mater and the skull; for if the extravasation has happened in the more interior parts, a surgical operation is not likely to afford relief.* Now, if the extravasation which compresses the brain, be situated immediately beneath the bone, I think there are signs by which it will be disclosed; and as sufficient notice has not been taken of these, I wish particularly to call the attention of surgeons to them.

I have already said, that, unless one of the large arteries of the dura mater be wounded, the quantity of blood poured out will probably be inconsiderable; and the slight compression of the brain which this occasions, may not be attended with any peculiar symptoms; or perhaps it may occasion some stupor, or excite an irritation disposing the subjacent parts to become inflamed: but both these effects will gradually abate, nor will any inflammation ensue, if proper means are taken to prevent it. It is indeed highly probable, that, in many cases which have

* In those cases, which I have seen, where blood was extravasated between the dura and pia mater, and a division of the former membrane was made for its discharge, in some instances the serous part of it only could be evacuated; for the coagulum was spread over the hemisphere of the brain, and had descended as low as possible towards its inferior part; in others, though a portion of the effused blood was discharged in a fluid or grumous state, a considerable quantity which was coagulated remained behind, so that very little relief was obtained by the operation. It seems then, that extravasation between the dura mater and the cranium is almost the only case which admits of being remedied by the use of the trephine.

done well without an operation, such an extravasation has existed. But if there be so much blood on the dura mater as materially to derange the functions of the brain, the bone, to a certain extent, will no longer receive blood from within; and by the operation performed for its exposure, the pericranium must have been separated from its outside. I believe that a bone so circumstanced will not be found to bleed; and I am, at least, certain, it cannot, with the same freedom and celerity as it does when the dura mater remains connected with it internally. I need hardly say, that, in the cases which I have related, there was not the least hemorrhage. But it is right to mention, that I have also twice been able, by attending to the want of hemorrhage from the outside of the cranium, to ascertain the extent to which the dura mater was detached within; and very frequently, when symptoms appeared to demand a perforation of the skull, I have seen it contra-indicated by the hemorrhage from the bone; and, as the event has proved, rightly.

When the bone has remained long bare, the case may become perplexing. I once scraped a portion of the cranium which had been some time denuded, and found that it bled in such a manner, as, in my opinion, sufficiently to point out the adhesion of the dura mater, and of course the inutility of employing the trephine.*

Where the extravasation on the dura mater is but small, it will probably not require any operation. A slight hemorrhage from the bone, which may happen from the anastomosing of the vessels within its substance, will not, in this case, lead to any injuri-

* In aged persons, and in those in whom the circulation has been rendered languid by the accident, the mode of distinction which I have pointed out, may indeed be less conclusive.

ous error. But from what I have observed, I am inclined to believe, that even a small effusion of blood will diminish the hemorrhage from the superincumbent bone.

Mr. Pott had an idea, that the bone would perish when the dura mater was detached for a considerable space from its inside; and some cases which he has related, seem to favour this opinion: but many other cases to be met with in authors, and many which have occurred to my observation, prove that the opinion was not well founded. Indeed we cannot suppose that the bone would perish from this cause; for it still receives blood, not only from the anastomosing of vessels within its substance, but also from the pericranium externally; and the success which has of late attended the operations for aneurism in the lower limbs, shows that parts of great bulk and vascularity will continue to live when their usual supply of blood is very much diminished. If, however, the dura mater should be detached for a considerable extent from the inside of the skull, at the same time that the pericranium should also be stripped from its outside, I am inclined to believe that a portion of the bone would, in that case, die and exfoliate.

## SECTION III.

### *Cases of Fungus, or Hernia Cerebri.*

### CASE XV.

A MAN, about forty years of age, was knocked down, and had a considerable part of the parietal bone, near the coronal suture, depressed, by a stone falling on his head from a high building. A portion of bone was taken out, and the depressed piece elevated. The patient, after this, seemed to obtain great relief from the stupor under which he had till then laboured. But the next day, he became very restless and delirious, and frequently endeavoured to get out of bed. Evacuations were prescribed, and a blister applied to his head, by which means the symptoms were lessened, but did not entirely go off; they continued near six days, only varying somewhat in degree. His strength was now very much reduced; and though he became more tranquil, he was still delirious, and a coma supervened, which increased daily.—On the tenth day, upon uncovering the wound in order to dress it, a hernia cerebri appeared, rising through an ulcerated opening in the dura mater. The tumour at this time was not larger than a pigeon's egg; the pia mater, stretched over its surface, was inflamed; and a turbid serum oozed at its side from beneath the dura mater. On the following day, the tumour had acquired the size of a hen's egg, was still smooth on its surface, and apparently ready to burst. On the day after, before the time of dressing, the man died. —Upon examining the tumour now, it was found

larger than before, and of a dark colour, with an irregular granulated surface; which appearance seemed owing to coagulated blood which adhered to its surface, as the part had bled so much, that one half the cap which the man had worn, was rendered quite stiff by it. In raising the top of the skull to inspect the contained parts, the tumour was in some degree torn from its basis. The pia mater was in general much inflamed, and, as well as the dura mater, was deficient at the place where the tumour protruded. A part of this tumour being cut off where it was lacerated, appeared to consist of coagulated blood of a fibrous texture. The brain was now taken out, and the tumour carefully examined, when it was found to be of the same nature throughout, and to have originated within the substance of the brain, about an inch below the surface; but I could not discover the open vessel from which the hemorrhage had proceeded.

The appearances, on dissection, clearly explained the cause of the symptoms which had taken place, and rendered it evident, that the disease under which this man had chiefly laboured, was inflammation of the pia mater. The nature of the tumour, also, was not less satisfactorily pointed out. It was plain, that, in consequence of the brain being injured to some depth beneath the surface, disease of the vessels, and consequent effusion of blood, had ensued; that the effusion was for a time restrained by the superincumbent brain and its membranes; but these gradually yielded to the expansive force exerted from within, and at last giving way altogether, the fluid blood oozed out and congealed upon the surface of the tumour. It appears very probable, that the disease frequently described by the term *hernia cerebri*, consists, as in this instance, of a tumour formed by coagulated blood; for an organized fungus could

hardly be produced in so short a time as that in which these tumours are usually formed.

### CASE XVI.

A carpenter, while at work in a newly-built house, was crushed by a part of the wall falling in upon him. His abdomen was bruised, his clavicle broken, and his head wounded. Beneath the wounded scalp, the right parietal bone was found fractured and depressed. He was slightly comatose for many hours after being brought to the hospital, yet answered rationally to those questions that were put to him. As the coma, however, remained, and his pulse did not beat with the freedom that is usual, the surgeon under whose care he was admitted, thought it right to trephine him. Accordingly, one perforation being made, the depressed bone was elevated. No blood was found upon the dura mater, nor did any thing indicate the propriety of using the trephine a second time. The patient was largely bled; and saline medicines, with antimony and opium, were given. As he complained much of pain in his belly, fomentations were applied to this part, and clysters administered occasionally. He was again bled on the second and fourth days after the operation. At the end of a week the antimony was omitted, on account of his weakness; and he seemed to get rather better, until December 7, twelve days after the accident, when a hernia cerebri appeared, rising through an aperture in the dura mater, opposite to the perforation in the skull. It increased rapidly in size, and exhibited the same appearance described in the foregoing case.—Two days after this, the patient died.

On examining the head, the dura mater was found every where adherent to the skull; but on its inner

layer there was a secretion of pus. The hernia cerebri, which had pushed up through an ulcerated opening in the dura mater, was of a fibrous texture, and evidently formed of congealed blood deposited in the medullary part of the cerebrum; the containing cavity being about an inch diameter, and its parietes appearing to be the substance of the brain condensed by pressure. I was equally unsuccessful here in my search after the vessel, whence the blood had issued. The ventricles of the brain were full of a serous fluid mixed with blood, and a large abscess was also found in the spleen.—In this case, the mental faculties were not deranged as in the former. Both the symptoms and dissection show the disease to have consisted in the effects of concussion, with inflammation of the dura mater, and subsequent effusion into the ventricles of the brain.

The opinion I had formed respecting the nature of hernia cerebri was now confirmed; and I think it received additional illustration from the following case, although the disease was in a different part of the body.—A patient in the hospital had a disease in the head of the tibia, from whence there arose an unhealthy fungus, which Mr. Blicke removed; and afterwards, the bone was kept bare by caustic applications, in hopes that a separation of the diseased parts would take place. The patient, however, became feverish, and his health was much impaired. On the cessation of the fever, there suddenly arose, within the wound, a fungus-like substance, about the size of a large apple, which seemed to sprout from the bone; it was of a livid colour, and its surface appeared as if covered with sloughs. I took off the tumour, which was nothing but coagulated blood, with the knife; and some blood oozed from its basis, but the hemorrhage was stopped by the application of lint. In a few hours, however, a

similar fungus-like tumour arose. As both the size and situation of the open vessel were unknown, and as the patient could neither support the loss of much blood, nor the irritation which an extensive wound, made in search of the artery, together with that arising from the diseased bone, would infallibly produce, it was judged best to remove the limb. This was accordingly done; and upon injecting water into the popliteal artery, it was found to be a branch of that vessel which had given way.

It seems that Paré, and the surgeons who lived about his time, often mistook the tumours that arose out of the cranium, for aneurisms, on account of their pulsatory motion. M. Louis, in the *Mem. de l'Acad. de Chirurgie*, tom. V. has well distinguished the nature and treatment of those proceeding from diseases of the dura mater or bone. There may, perhaps, be tumours of various kinds arising from the pia mater and brain; but if there are such, I believe they have not been discriminated; and the accounts given of many of them by authors, are similar to those just recited. They have generally been treated of under the name of fungus or hernia cerebri; and if the effused blood of which they consist, ever acquired vascularity, they might then deserve that title: but none of those that I have just noticed were of an organized structure.—Their formation seems to proceed from an injury done to a part of the brain by concussion or contusion, which has terminated in a diseased state of the vessels, similar to what occurs in apoplexy. The morbid state increasing, one or more vessels give way, and an effusion of blood into the substance of the brain ensues, which, if the skull were entire, would probably occasion apoplexy, but, where there is a deficiency of bone that allows it to expand, presses the surface of the brain and its

meninges through the vacant space. The dura mater soon ulcerates, and the tumour pushing through the openings, now increases with a rapidity proportioned to that with which the hemorrhage takes place within. At last, the pia mater, and the stratum of the brain which cover the effused blood, are so extended as to give way, and the blood oozes out and coagulates.—Thus, the quick growth, and all the other phenomena observable in these tumours, are satisfactorily accounted for.

The plan of treatment to be adopted with tumours of the kind which I have described, is next to be considered; but as I have had no opportunities of acquiring knowledge as to the treatment of these diseases, since I became acquainted with the nature of them, I can only offer a few general remarks on this subject.

Where no bad symptoms precede the appearance of the tumour, or where they go entirely away upon its being freed from the confinement of the dura mater, it may, perhaps, be most prudent not to interfere in the treatment of the complaint: for probably the hemorrhage will cease, and the coagulum will drop off in pieces,* or gradually waste away, and be no more renewed.† All that appears necessary, then, under such circumstances, is to cover the tumour and sore with some mild dressing, carefully avoiding all pressure, which both reason and experience show is likely to be attended with bad conse-

* See a case in the Edinburgh Medical Commentaries, vol. i. p. 98, where the tumour continued to increase for fourteen days, and had acquired the size of a goose's egg, when it dropped off in pretty large pieces. A similar case is related in the Medical Museum, vol. iv. p. 463.

† Fabricius Hildanus relates a case in his Fifteenth Observation, where the tumour arising from the brain became, in 24 hours, as large as a hen's egg, and afterwards gradually disappeared.

quences. Should the bulk of the tumour, however, become inconvenient, or render pressure from the dressings unavoidable, the practice which present experience has shown to be most successful, consists in occasionally paring off the tumour with a knife. In this manner Mr. Hill treated several cases with success.

But if the tumour continues to increase, and if the patient suffers a train of bad symptoms, apparently arising from irritation and pressure made on the brain, some further attempt to relieve him seems to be required. Under these circumstances, we have reason to suspect that the coagulum, from want of room to protrude, is enlarged internally; or that by plugging up the orifice in the bone, it prevents the escape of some fluid collected within the cranium.* The obvious mode of relief here appears to be, to enlarge the opening in the bone in proportion to the extent and increase of the tumour. Many surgeons have objected to the removal of much of the cranium, lest protrusions of this kind should ensue; but it is evident that these tumours arise from an injury and consequent disease of a part of the brain, the event of which must be more fatal if the bone were

* Mr. Hill, in relating a case of this kind, says, that he "was obliged to shave away the tumour, and push a lancet into its root as often as the stupor and other symptoms showed that matter was lodged there, by which the patient was uniformly relieved, and afterwards recovered."—(See his Cases in Surgery, p. 91-2.) But very different was the event in two similar cases (one is recorded by Scultetus, in his Armamentarium Chirurgicum, Obs. XIX.; the other in the Lond. Med. Journal, vol x. p. 277.), in which repeated attempts were made to prevent the growth of the tumour by compression: one patient died at the end of a month; the other not until nearly six months after the accident. In the brain of each there was found, upon dissection, a large cavity, which had been formed by the accumulation of a fluid that could not escape, on account of the aperture in the bone being closed by the tumour.

entire. A large removal of bone was formerly a frequent event; but a protrusion of this kind very seldom took place.

But although, by thus allowing a free escape to the effused blood, we may prevent the injurious effects of its pressure on the brain, yet the degree of hemorrhage may endanger the life of the patient.

The quantity of blood effused will depend on the magnitude of the vessels, or on their disposition to bleed. As the disease is generally situated not far beneath the surface of the brain, there is less risk of its proceeding from the former cause. If it arises from the latter, it is very likely that the distention caused by the confinement of the effused blood would irritate the vessels, and keep up their disposition to hemorrhage; therefore the treatment already recommended is likely to diminish it. But should the quantity of the hemorrhage seem to threaten the life of the patient, I should think it most proper to take away the coagulum, and to expose the cavity in the brain, in order to learn whether suffering some sudden loss of blood to take place, together with the exposure of the bleeding vessels, might not produce a beneficial change, and a cessation of the hemorrhage. I am induced to propose this mode of conduct, from reasoning founded on analogy: for in other parts of the body a hemorrhage will sometimes continue, notwithstanding a considerable pressure made by a large quantity of coagulum, together with that which the resistance arising from the closure of the external opening, and that which is occasioned by the dressings, conjointly produce. Yet, upon exposing the bleeding surface, the hemorrhage will cease, and never afterwards be renewed.

I am still further induced to propose this plan of treatment, because I do not perceive any other which

carries with it a probability of success. The impropriety of attempting to restrain the hemorrhage by pressure has been shown; ligatures cannot be applied, and styptics are known, by experience, to be dangerous.

I shall extract one case from the first volume of the *Memoires de l'Academie de Chirurgie,** to show that the removal of the coagulum is not likely to be attended with any alarming consequences.—A young man received a blow on the right parietal bone, which occasioned a fracture; some bone was removed, and a hernia cerebri was afterwards produced, which was repeatedly pared down with the knife. On the thirty-fifth day from the accident, the patient having intoxicated himself, while in this state, slipt his hand under the dressings, and laying hold of the protruding coagulum, tore it away with violence. The next day the surgeon found, that almost the whole of what he considered as corrupted brain, was removed, and a vacancy left, so deep, that he could see nearly to the corpus callosum. From this time forward the parts went on healing, until they got quite well; but the patient continued to labour under a paralysis of the left side, which had supervened the day after he received the blow.

It is obvious, from the nature of the substance of which the tumour is composed, that styptic remedies applied to its surface can have scarcely any effect in lessening its bulk, and none at all in putting a stop to its growth; and experience shows, that the more active of them are not only ineffectual, but highly dangerous. Hildanus, in his Fourteenth Obs. relates the case of a man who died in consequence of an empiric having dressed a tumour of this kind with alum and calcined vitriol. And Mr. Hill tells

* See the Memoir of Mr. Du Quesnay, 10th Observation

us (p. 198), that, after shaving off the protruding part, he once sprinkled the basis with some blue vitriol, and another time with red precipitate; but found that "his patient had a very bad day after each of these;" no doubt, in consequence of their being dissolved by the discharge, and insinuating themselves between the tumour and the edges of the skull, so as to get into contact with the sensible parts within; for, that it was not owing to their effect upon the tumour, is evident from its indolence when he had removed it with the knife.*

* The foregoing cases explain a particular kind of protrusion, which seems to me to have been frequently described by authors, and of which they serve as specimens. Such occurrences cannot be observed without surprise; the suddenness of the protrusion scarcely admits the supposition of the protruded part being organized. It was never meant by the recital of these cases to deny, that the surface of the brain, when exposed and irritated, would throw out a vascular fungus; it was only intended to describe a species of those appearances which had been denominated fungus or hernia cerebri. In all the cases of true fungus cerebri which I had seen when I first wrote the foregoing account, the fungus grew so slowly that it could not be mistaken or confounded with the appearances which took place in the cases I have cited. Since that period, I have seen cases in which the fungus grew much more rapidly, yet none in that degree which would make it liable to be confounded with the appearances described in the present section. The curative indications in the true fungus cerebri seem to be, to diminish those causes which occasion the brain to be thrust upwards against the bone, and to apply gentle pressure from without, so as to give that degree of support which the part ought naturally to receive from the dura mater and bone.

## SECTION IV.

### *Concussion of the Brain.*

AS I am of opinion that the effects of concussion have not been justly described by authors, and as the symptoms related by them are not, according to my experience, those which usually occur, I have therefore selected two cases out of a great number that I have seen, in order to show what have appeared to me the common consequences of this injury; and I shall afterwards offer some remarks respecting the treatment of this affection.

### CASE XVII.

Harriet Silverthorn, aged twenty-three years, slipped down stairs, and struck her occiput against some of the lower steps, by which the integuments were divided about half an inch in length, but the wound was not deep, nor were the surrounding parts much bruised. She was taken up senseless, was bled, and the next morning conveyed to St. Bartholomew's Hospital. When brought in, she was comatose; could not be made to answer any questions; yet she drew back her arm when pinched, and seemed very uneasy when the wounded parts were pressed upon. Her breathing was without stertor, but performed at some interval, as if she did not wish to inspire until obliged by necessity. The pulse, which was full and labouring, intermitted every fourth or fifth stroke.—Eight ounces of blood were immediately taken away, and an opening medicine given, which procured three stools, after which she was ordered a mixture, containing aqua ammoniæ acetatæ, and

antimonial wine.—The next day (*Friday*) she was rational, put out her tongue when desired, and said she had no pain in her head; her breathing was more regular, and her pulse free from intermission. (*Saturday*,) she was still more sensible, and gave some account of herself; complaining now of head-ach, and general uneasiness. The mixture was continued, the purging medicine given again, and a blister laid on between her shoulders.—(*Sunday*,) her pulse was harder; she was sensible, but restless; complained of pain in her forehead, sat up in bed, and wanted to go home. Six or eight ounces of blood were taken from her temples, and the mixture ordered to be continued as before.—(*Monday*,) she was much more composed; but as she had still some pain in her head, a blister was applied to it.—(*Tuesday*,) she had slept quietly during the night, answered rationally, but with quickness, and eagerly desired to go home. As the blisters appeared to have been serviceable, that on her neck was renewed.—(*Wednesday*,) she was perfectly quiet, and in every respect better; nor had she, after this, any complaint worth mentioning.

## CASE XVIII.

A Frenchman, twenty-seven years of age, who had been many years in England, and (as it afterwards appeared) spoke our language perfectly, had met with some accident (but in what manner, I know not), in consequence of which he was brought to the hospital. He was then very comatose, and expressed much uneasiness at being roused from that state; yet he put out his tongue when bid, but did not give a rational answer to questions put to him, and his replies were made in his native language. His pulse was regular, strong, and about 96 in a

minute. Ten ounces of blood were taken from his arm; and after being purged, the common saline mixture, with antimonial powder, was ordered to be given. In the night he grew delirious, got out of bed, and tore the bandage from his arm; in consequence of which he lost a good deal of blood before it was perceived. This, however, seemed of use to him; for he became more tranquil after it, and lay quietly dozing till morning. Next day, he was more rational, and complained of pain in his head. When I told him that if he kept quiet, he would soon be well, he said, he hoped so; and appeared solicitous to know what should be done to him. His pulse was only 80, and not strong. A gentle laxative was given, and a blister applied to his head.—On the third day, he was much more sensible, spoke with clearness, and mentioned the pain being in the fore-part of his head; yet, when I asked his age, he told me he was but sixteen years old.—*Tuesday* (fourth day), he appeared more excited and wild; his tongue was dry, but his pulse only 75. Nine ounces of blood were taken from the temporal artery.—Fifth day, his pulse was only 70, and perfectly natural; yet he had pulled off the dressing from his blisters, and seemed to be very irritable.—Sixth day, still pain in his forehead, pulse rather quicker, but tongue not furred. After this he gradually recovered, without any particular symptom occurring, and without any other medical treatment.

It is not likely that, in either of these cases, extravasation, at least to any considerable degree, had taken place within the head, since in neither of them was there stertor, dilatation of the pupils, or insensibility. They may, therefore, I think, be considered as exhibiting the symptoms which attend simple concussion. The foregoing cases were indeed instances of but slight concussion to what the brain sometimes suffers, and which proves fatal. To dis-

play the symptoms which occur in the worst cases, I relate the following instance.

CASE XIX.

W. Thomas, about thirty years of age, fell from the top of a brewhouse, a height of at least 80 feet. His hand being stretched out, first sustained the shock, by which the carpal bones were separated, and driven upwards, some before, and others behind the ends of the radius and ulna, the articular surfaces and periosteum being at the same time forced off the latter bones. I mention these particulars to show the great violence of the fall. The man's head afterwards struck the ground, as appeared by a bruise on his face: but the cranium was not injured. When brought to the hospital, he appeared almost deprived of life, his body being cold and his pulse scarcely to be felt. The gentlemen then attending, put his feet into warm water, and gave him an opiate.

After this he gradually became warmer, and it was observed that there was not much dilatation of the pupils, and but little stertor in respiration. I saw the patient next morning, at which time his skin was very hot, and he perspired copiously. His breathing was repeated at regular intervals, but the expirations were made with unusual force. The pulse was extremely irregular, both in frequency and in strength; generally about 140 in a minute. His pupils were moderately contracted, his eyebrows drawn into a frown as if he suffered pain. When I spoke to him softly, he did not answer. I pinched his hand slightly, but he did not move; but when I repeated this a little harder, he drew it away with seeming vexation. He disliked that his eyes should be examined. When by speaking loud, I roused him, and inquired if his head ached, he answered, Yes. I got him to swallow some opening

medicine, which emptied his bowels; and four leeches were applied to his temples; but they extracted very little blood, and I thought his pulse countermanded any further evacuations.

In the afternoon, he appeared better. His pulse was more regular, and his skin of a more natural temperature; his pupils, however, were more contracted, and his sensibility increased. I tried the effect of giving him forty drops of tinct. opii, thinking it might diminish sensibility, and keep him quiet for some time, during which the vascular system (which seemed to be particularly deranged) might perhaps regain its powers. The opiate increased his disposition to sleep, and he appeared to suffer less pain; but in the evening, his pulse was more feeble and frequent, and his skin hotter, and quite wet with perspiration. Wine was now given to him, but without any apparent benefit; the powers and actions of life gradually diminished, and before morning he died.

On dissection, there appeared every mark denoting violent inflammation of the brain and pia mater, of short duration. The minute arteries of the pia mater were turgid with blood; in many places there was the appearance called blood-shot, which was also to be seen in the lining of the ventricles. Dark-coloured, and in some places, bloody, coagulable lymph filled all the recesses between the tunica arachnoidea and pia mater. On dividing the substance of the brain, all its vessels appeared as if injected with blood.

I am inclined to believe that the medical treatment of this patient did him niether much good nor harm. The means employed seem to have acted on him as on a person in health. The opening medicine rendered him cooler, and quieted a little the disturbed actions of the system. The opiate made him more still, and disposed him to sleep.

I leave it to practitioners to consider, whether cordials would have been of any service in this case. Would they not rather, by stimulating the nervous system, have increased the disturbance of the sensorium, and, by exciting the heart and arteries, have tended to aggravate the inflammation of the brain.

I add another case, because it is remarkable for the violence of the subsequent inflammatory symptoms. The case was attended by Mr. Sheppard of Chew Magna, who was, at the time it happened, dressing pupil to Sir Charles Blicke at St. Bartholomew's hospital. To his judicious and unremitting attention I cannot but attribute in a great degree the ultimate welfare of the patient. The account which I have drawn up, is taken from Mr. Sheppard's notes.

### CASE XX.

David Davis, a robust man, thirty-five years of age, was admitted into St. Bartholomew's hospital on the 21st of November 1799. He had fallen from a considerable height on his head, and had bruised and wounded the scalp, but without fracturing the bone. He was, when brought to the hospital, so far insensible, as not to be affected by slight impressions, and his extremities were cold. His feet were put into hot water, and, after some time, he became warm and more sensible, and the pupils of his eyes contracted as in common. Twelve ounces of blood were taken from the temporal artery, and a purging medicine given. On the following day, the pulse being full and hard, sixteen ounces more of blood were taken away, and the purging medicine repeated, which procured several stools, and a blister was also applied to the nape of the neck. Notwith-

standing these measures, however, he became delirious, and his skin felt hot, and he complained of pain in his head. Twelve ounces more of blood were therefore taken, and three grains of pulvis antimonialis given every fourth hour.

November 24. The delirium still continued, but the patient lay more quiet: his pulse was 120, and full, therefore twelve ounces of blood were taken, and as the delirium and strength of the pulse still continued, in the evening the bleeding was repeated to the extent of twelve ounces. His bowels were also emptied by magnesia vitriolata and senna. Afterwards he had thirty drops of tinct. opii given him at night. He slept some hours in the night, and next morning his pulse was less hard, and only 96 in a minute; his answers to questions were also much more rational, and delivered in a less loud and quick tone of voice than before. For during the greater part of the delirium he had been very unmanageable, rolling about in bed and endeavouring to get up, and speaking in a loud and fierce manner. Towards the evening the symptoms again increased; his pulse was 120, and harder and fuller than in the morning; his skin was hot, and he complained of thirst. He had taken purging medicine in the morning, which had operated. Three grains of antimonial powder were now given every fourth hour, and his feet put into warm water, in hopes of procuring perspiration: ten ounces of blood were taken from the temporal artery, and the opiate repeated at night.

25th. The patient had slept during great part of the night; his pulse 100; he complained of cold, though his skin was hot; and of great pain in his head. More stools were procured, and twelve ounces of blood were taken from the temporal artery. He now took six grains of pulv. ipecac. comp. every four hours.

26th. He had been delirious during the former part of the night, but had slept towards the morning; in other respects he was much as before. In the evening, as his pulse would bear it, twelve ounces of blood were again taken away.

27th. Pulse softer and frequent. He had three stools from medicine in the evening. The delirium seemed to have a little subsided, and he was much inclined to sleep, so that it was difficult to obtain an answer from him.

28th. A blister was applied to his head, and in the evening his pulse becoming full, ten ounces of blood were taken from him. Two grains of opium were given him at night.

29th. He had slept well but complained of his head, and of difficulty in swallowing, and in the evening had hemiplegia of the right side of his body.

30th. He had slept but little, the bowels lax, the pulse small and frequent, the hemiplegia continues.

We had thus far been endeavouring, by the most powerful means, to subdue a violent inflammation of the brain, and could scarcely be said to have accomplished our design, when a new affection called for attention. I think it can scarcely be doubted, that the hemiplegia was the effect of pressure made by an effusion of fluids, in consequence of inflammation, operating probably chiefly on the left hemisphere of the brain, so as to paralyze the opposite side of the body. Under this persuasion, and without expectation of success, I directed that two drachms, by measure, of strong mercurial ointment should be rubbed in on his arms and legs night and morning, and that five grains of the pil. hydrarg. with one grain of opium, should be given three times a day. These means were continued for three days without any striking amendment being perceived, but on the fourth (Dec. 4.) he stretched out his right arm

when required, and was able to swallow without difficulty. As he was getting better, the same plan was persevered in till the 9th, when the mercury had affected his mouth, and produced a diarrhœa. He now knew all those persons who attended him, and his state was surprisingly altered. During the inflammation of the brain he had been very unmanageable, and his replies and expressions were fierce and loud. Now he was extremely tractable, and wept whenever he was spoken to. His pulse was very feeble, and beat but 90 in a minute. It seems right to mention that a few days afterwards, when he was slowly recovering, one of the wounds of the temporal artery gave way, and he lost perhaps fourteen ounces of blood before it was perceived. This circumstance of course made him weaker, and increased the frequency of his pulse, but it did not much impede his recovery, which, though very slow, was very perfect. Extensive sloughing of the integuments of the nates had taken place, which it does not seem requisite to mention, but inasmuch as it tends to show the reduced state to which he had been brought. Indeed if this patient had not possessed a vigorous constitution, it seemed scarcely possible that he could have survived the debility which this disease and the treatment conjointly produced.

The extent of the evacuations, that surgeons are obliged to make in inflammations of vital organs, is such, as would deter the unexperienced from pursuing them, and must astonish those who have employed them with success, that they could be borne with so little apparent injury. It can only be accounted for by considering the disease as the stimulus which keeps up the actions of the constitution under such exhausting measures, as would occasion them to sink but for this excitement.

The opinions, that prevail amongst surgeons res-

pecting the treatment of concussion, are very different. Many late writers advise stimulating cordials, such as wine, and volatile alkali, to be given; while others pursue a directly opposite conduct. Nor do they agree in the account of the symptoms, which they consider as depending on this species of injury. Most writers represent the subject, as if the deranged state of the brain, which is the immediate consequence of the shock, continued to the termination of the patient's illness or of life; while, in the cases given by Mr. Pott, the symptoms appear to proceed more from the inflammation which ensues, than from the concussion.

The whole train of symptoms following a concussion of the brain, may, I think, be properly divided into three stages. The *first* is that state of insensibility and derangement of the bodily powers, which immediately succeed the accident. While it lasts, the patient scarcely feels any injury that may be inflicted on him. His breathing is difficult, but in general without stertor; his pulse intermitting, and his extremities cold. But such a state cannot last long; it goes off gradually, and is succeeded by another, which I consider as the *second* stage of concussion. In this, the pulse and respiration become better, and though not regularly performed, are sufficient to maintain life, and to diffuse warmth over the extreme parts of the body. The feeling of the patient is now so far restored, that he is sensible if his skin be pinched; but he lies stupid, and inattentive to slight external impressions. As the effects of concussion diminish, he becomes capable of replying to questions put to him in a loud tone of voice, especially when they refer to his chief suffering at the time, as pain in the head, &c.; otherwise, he answers incoherently, and as if his attention could not be excited, or was occupied by something else; he is, in short,

like a man in a heavy sleep. The concussion of the brain, lastly, produces a state of inflammation of the organ, and this constitutes the *third* stage, which is the most important of the series of effects proceeding from this cause.

These several stages vary considerably in their degree and duration; but more or less of each will be found to take place in every instance where the brain has been violently shaken. Whether they bear any certain proportion to each other or not, I do not know. Indeed this will depend upon such a variety of circumstances in the constitution, the injury, and the after-treatment, that it must be difficult to determine.

With regard to the treatment of concussion, it would appear, that in the first stage very little can be done. From a loose, and, I think, a fallacious analogy between the insensibility in fainting, and that which occurs in concussion, the more powerful stimulants, such as wine, brandy, and volatile alkali, are commonly had recourse to, as soon as the patient can be made to swallow. The same reasoning which led to the employment of these remedies in the first stage, in order to recal sensibility, has given a kind of sanction to their repetition in the second, with a view to continue and increase it.

But here the practice becomes more evidently pernicious. The circumstance of the brain having so far recovered its powers, as to carry on the animal functions in a degree sufficient to maintain life, is surely a strong argument that it will continue to do so, without the aid of such means; which tend to exhaust parts already weakened, by the violent action they induce.

It seems probable that these stimulating liquors will aggravate that inflammation which must ensue sooner or later. The access of it, in the cases which

I have related, is sufficiently evident; and its cure is to be effected by the common methods. The great benefit of evacuations was, in those cases, very evident. Indeed, it appears to me, that there is no complaint which requires such means to be more rigorously prosecuted, than an inflammation of the brain or its membranes.

In addition to the reasoning which I have offered here, I would observe, that surgical books abound with cases in which suitable evacuations have been freely employed in concussion, with the best effects; while the advocates for a contrary practice have rested their arguments upon vague theory, and communicate no particulars of their success.

If the foregoing cases exhibit the genuine marks of concussion, the administration of cordial medicines, which has been so much recommended, appears to be very ill adapted to the relief of such an injury.

I have seen so many additional cases of concussion, so exactly corresponding to those formerly related, that I am more fully satisfied of the truth of the representation which has been given of them. I have in consequence been led more and more to wonder, that a contrary plan of treatment to that which has been so uniformly successful, could ever have been recommended, and to conjecture what cases could have occurred, in which such opposite practice must not have been strikingly prejudicial. Probably I may point out such cases; and as I do not find them described in books of surgery, because they have not been deemed sufficiently important, it may not be improper briefly to mention them.

A young lady was stooping in a closet, and rising up suddenly and forcibly she struck her head against a shelf. The blow occasioned extreme pain, but did not stun her. She went down stairs without men-

tioning the accident, and after sitting with her friends for a short time she fainted. As it was in the evening she went to bed, but could not sleep for pain in her head, and the next day her pulse was very languid, and her extremities cold; she complained of great pain when the scalp was slightly touched, and said there was a sensation as if cold water was dropping on it. She took some gentle opening medicine, which relieved these symptoms, but she could not sit up for many days, and it was a considerable time before she recovered from the languor, which the blow had occasioned: but neither fever, nor failure of sensation, or of intellect, took place in the slightest degree. I have seen many similar cases, and in one the patient said his sensations were such as would induce him to believe that his brain was loose, and moving on the inside of the skull. All these cases were relieved by slight evacuations, as gently opening medicines, leeches, or cupping, though I am inclined to believe that a contrary plan of treatment, which has been recommended in concussion, might have been pursued without material detriment. Cases of this description are to be considered as arising from nervous symptoms, attendant upon slight injuries, rather than as effects of serious concussion. Mr. Pott, in speaking of concussion, says, that he never knew patients recover from the immediate consequences of it, without an imperfection in some sense, or part of the body, remaining. The result of my own experience has been very different; and yet I am ready to believe that such events may not unfrequently take place, as I know from examination, that the substance of the brain is sometimes lacerated and disorganized in violent concussions. I have, however, examined other cases of fatal concussions, without observing any such lesion of the substance of the brain.

It has hitherto been considered as a desirable object, to point out any marks by which we might distinguish between compression and concussion of the brain; but I believe no such criteria have yet been communicated to the public. If we judge of the symptoms of compression from what occurs in cases of apoplexy, or from cases like those which have been related of the rupture of the middle artery of the dura mater, (in one of which cases it was evident, that concussion had no share in producing the symptoms,) we must, I think, be of opinion, that pressure on the brain occasions insensibility partially, or generally, and in a degree proportionate to its quantity. In extreme cases, such as I have cited, the insensibility is manifested by every circumstance. The pupil of the eye is dilated, and cannot be made to contract even by a strong light. The respiration is slow and stertorous, and the pulse proportionately slow and labouring. There is no vomiting, which would indeed indicate sensibility of stomach. The limbs are relaxed, as in a person just dead. No struggles take place, nor signs of sensation appear during the operation; but on the pressure being removed, sensation and intelligence are immediately restored. In concussion, the insensible state is of short duration, and during its continuance the body is generally cold, and the pulse feeble and intermitting. Afterwards the skin is hotter than usual, the pulse and respiration more frequent; the former often intermits, and the latter has not the stertor of apoplexy.* The pupil of the eye is not dilated, but rather contracted. The counte-

* But the absence of stertor must not be relied on as a proof that there is no compression; for Morgagni relates dissections of apoplectic persons, where the effusion was considerable, yet no stertor had occurred; and I have seen cases where it took place only in a very slight degree.

nance expresses pain or uneasiness; and vomiting occasionally takes place. The state of the patient is like that of a heavy and uncomfortable sleep; yet, being roused, signs, even of intelligence, appear.

In fractures of the basis of the skull, however, it must be acknowledged, that the symptoms are often deceptive. In general the symptoms resemble those of concussion, yet sometimes a degree of insensibility may be observed like that produced by pressure, when no pressure has really taken place.

I cannot better represent to the reader what I conceive of the value of the distinctions which I have made, between the symptons of compression and concussion of the brain, in ordinary cases, than by relating briefly some of the particulars of a case sent me by Mr. Davies, surgeon of Tetbury, who was formerly an industrious and intelligent student at St. Bartholomew's hospital. The case also, in my opinion, deserves to be recorded for other reasons, which I shall afterwards mention.

A young woman was knocked down by a blow on her head, and the place where the blow had been received was denoted by a soft swelling of the scalp. She lay in a state of apoplexy, and appeared like a corpse. The pupils of her eyes could not be made to contract by the approach of a strong light; her olfactory nerves were unaffected by the most pungent odour; her ears were equally insensible to sound; she manifested no uneasiness upon being sharply pinched; her pulse was small and intermitting, and her breathing scarcely perceptible; and a cold and clammy moisture covered her skin.

Mr. Davies immediately divided the scalp, and finding the bone fractured, he trephined it. There was no blood upon the dura mater, but that membrane was thrust up into the aperture made by the trephine. The dura mater being divided, about five

ounces of blood were suddenly discharged, and the patient rose up in bed, as if waking with affright. Her pulse and respiration were soon relieved, and became natural. A plan of treatment calculated to prevent and subdue inflammation was strictly pursued, and the patient did well without any remarkable occurrence taking place.

From what has been already said it may be inferred, that I do not consider the division of the dura mater as a slight evil. It is, doubtless, the duty of a surgeon, when he has been urged to trephine, on account of strong symptoms of pressure, to divide that membrane, if it be thrust upwards into the aperture which he has made. I have said that frequently the blood is coagulated, or so thickly grumous, that the whole of it cannot be discharged. In the present case, however, the promptitude of the surgeon's conduct enabled him happily to discharge the effused blood whilst it remained fluid.

## SECTION V.

### *Inflammation of the Pia Mater.**

THE inflammation of the dura mater, which occasionally succeeds to injuries of the head, has been well described by Mr. Pott. Patients labouring under this complaint are feverish, have a constrictive pain in the head, but continue rational, and give a clear account of their symptoms, until matter forms, or inflammation of the internal parts ensues. This is what we might naturally expect from the structure of the dura mater, the manner in which it is supplied with blood, and its vessels having little connexion with the brain. When the pia mater becomes inflamed, as the brain derives a considerable portion of its blood through the vessels of that membrane, the disease is instantly communicated to the cerebrum, and deranges its functions. This derangement varies in its nature and degree, accordingly as the inflammation of the pia mater is more or less violent; as it is confined to the surface, or extends to the internal parts; as it produces a greater or smaller secretion of fluid which compresses the brain; or as it is more or less blended with the effects of

* In the former edition, I related in this section cases of inflammation of the pia mater, in which this disease occurred distinctly, and terminated fatally, in order to authenticate the specific symptoms attendant on it. As many of the foregoing cases, however, are instances of this disease coming on after concussion or fracture, and yet occurring as a distinct disease, and uncombined with symptoms arising from the peculiar nature of the injury, I think a further narrative of cases superfluous.

concussion. The state of the patient will vary considerably under these different circumstances. If the inflammation be violent and general, the patient will be irrational and disturbed, having his mind strongly affected by wrong ideas, and endeavouring to act in consequence of them. If the inflammation be moderate, and affect the surface only, he will be irrational, uneasy, restless, and perhaps endeavour to get out of bed, but without the violence of mania. Should a moderate inflammation be blended with the effects of concussion, he will have less appearance of irrationality, will lie pretty quiet, and inattentive to slight impressions, as appeared in some of the cases related.—I am not able to particularize every variety that may occur in the symptoms; but in all, there must be more or less derangement of the powers, both mental and corporeal, depending upon the degree of inflammation, &c.*—The symptoms, which chiefly characterize the complaint, are those of an increase of sensibility; the pupils of the eyes are contracted; the patient often withdraws his arm on being touched, and his pulse and tongue denote general as well as local inflammation. It seems of the utmost importance, that those means which in general cure inflammation, should be prosecuted very vigorously at the commencement of this complaint; since otherwise, although they may check, they will not overcome it. Large blood-lettings, brisk purging, and extensive counter-irritation by blisters, ought to be employed at the very commencement; for, if omitted, the disease will then become esta-

* An unusual infirmity of the bodily powers is sometimes observed, accompanied with tremors, low delirium, and exceedingly rapid pulse; yet, on dissection, a slight inflammatory appearance of the pia mater and brain is all that can be discovered. Such a state sometimes occurs after an abscess has formed in the brain.

blished, and the powers of the body will soon be too much sunk to admit of the same active treatment at a later period.

I have here represented the general effects of inflammation of the pia mater when it arises from external violence. In other cases, indeed, where it comes on, as it were, spontaneously, or without any powerfully exciting cause (in which case it generally falls under the care of the physician), it has appeared to have effected the brain but little, and to have been very slow in its progress, and inactive in its nature. In such cases it has produced a deposition between the tunica arachnoidea and the pia mater, or a collection of serum between the former membrane and the dura mater. Under these circumstances, I have learned that the rationality of the patient has been scarcely deranged. And as such a state of disease may occur after an accident, I have thought it right to mention it in this place.

In the generality of cases of injury done to the head, the symptoms of concussion, compression, and inflammation are so combined as to appear inexplicable. It is only by an attention to those rare cases, in which the symptoms of each appear distinctly, that we are likely to increase our knowledge of their specific effects. I conclude this review of the effect of injuries done to the head, by observing, that whatever may be the nature of the injury which the brain may have sustained, still the disorder induced in that organ must produce a proportionate disorder in the functions of the digestive organs, and the reaction of the latter affection must aggravate the former. Some remarks on this subject are inserted in the first volume of these observations. To corroborate further the statement there given, and to bring this subject before the reader's mind

on the present occasion, I relate the following case, which occurred about two years ago.

### CASE XXI.

A young gentleman received a severe wound on the forehead, which laid bare the bone, and stunned him. By venesection and the usual treatment, the immediate ill consequences of the injury were mitigated and subdued; so that the wound healed, and he was considered to be convalescent. He was not, however, well; he had strange nervous feelings about his head; and after three months he became very much disordered. Calling at a friend's house, he discoursed wildly, and became so delirious, that they were obliged to confine him in bed by means of a strait waistcoat. Ten ounces of blood were taken from him, and I was desired to visit him. His pulse beat more than 100 in a minute; his skin was hot and dry; his tongue was furred, but it could not be distinctly seen; he showed no signs of understanding to any questions that were put to him; he rolled his head about; and breathed altogether by means of the ribs, without moving the diaphragm. When I pressed even slightly beneath the ensiform cartilage, he seemed to suffer greatly, and became slightly convulsed. The blood which had been taken from the arm did not indicate inflammation, and I was therefore induced to consider the symptoms as arising from nervous irritation, caused, or aggravated, by disorder of the digestive organs. As it was impossible to get the patient to swallow, we formed two grains of calomel and 10 of jalap into an electuary, by means of a little honey, and besmeared the back part of the tongue with it. The same medicine was repeated after six hours. The second dose produced

two copious discharges from the bowels, after which his head was so much relieved, that when I called on him the following morning, he was perfectly rational, and his pulse was tranquil. I then questioned him particularly respecting the kind of pain in his head; and he told me, that it was not severe, nor accompanied with throbbing; that it was confined to the part which had been wounded, and it was constant. As the purgative medicines had not begun to operate till towards the morning, I thought that their effects might continue, and therefore only advised, that he should take saline draughts in a state of effervescence, during the day; and food of an unstimulating quality. No more evacuations however took place from the bowels, and in the afternoon the patient again became delirious, so that when I saw him in the evening he did not seem to understand any thing that was said to him. He lay, however, much more quietly than he had done on the preceding evening, only occasionally moving his head to one side or the other, and then seeming as if he was looking for some object by the side of the bed. The jalap was now again given him, with the addition of one grain of calomel. The medicine operated twice in the night, and next morning he was again perfectly rational. We now insured the continuance of discharges from the bowels, by directing him to take some common purging mixtures, if his bowels did not act in six hours. The delirium did not return, and the patient soon became as well as he had ever been since the accident. Yet still his digestive organs were not in a healthy state. His tongue was much furred; his bowels either costive or purged, and generally in the latter state; and the secretion of bile was either deficient in quantity, or faulty in quality. He remained in this way for many months,

though various kinds of medicines were given for his relief. At last a spontaneous diarrhœa occurred, and as I was informed by his physician, his bowels afterwards regained their natural tranquillity and functions.

## SECTION VI.

### *Cases of Disease of the Bone and Dura Mater.*

THE diseases of the cranium, and consequent affections of the dura mater, have been well described by some French and German surgeons.* But as they have not, I believe, been explained by English writers, I shall confirm the accounts which we have received of them by additional cases; and afterwards shall offer some remarks on this subject.

### CASE XXII.

A man, between thirty and forty years of age, was salivated for complaints in his head, supposed to be venereal. There were two tumours of the scalp; one a little before the coronal suture, and the other a little above the posterior superior angle of the left parietal bone. The man's health was greatly reduced by the course of medicine he had undergone, as well as by the disease, which had considerably increased during the use of mercury. The integuments covering the posterior tumour had ulcerated; and a probe could be passed under them, so as to discover a considerable extent of bare and carious bone. The surgeon, under whose care he was admitted into the hospital, divided the integuments, and perforated the diseased bone, which was found separated from the dura mater. That membrane also had a very morbid appearance, being covered with a soft sub-

* Vide Mons. Louis' Memoire, in the fifth volume of the Mem. de l'Acad. de Chirurgie, and Haller's Disputationes Chirurgicæ.

stance of a dirty reddish colour. On pressing down the dura mater with a probe, to see if it was detached to any extent, nearly a table-spoonful of healthy pus issued from beneath the bone, about an inch behind the part perforated. The surgeon thought this might be sufficient to relieve, and therefore deferred making another perforation. But the man, who had lain stupid, though not irrational, and had subsultus tendinum accompanied with great debility, grew shortly after delirious; in which state he continued about two days, when he became convulsed, and died.

On dissection, purulent matter was found on the dura mater, beneath both the carious portions of bone. The membrane also, which was detached, was much thickened, so as in some degree to indent the surface of the brain. The pia mater was generally inflamed; and a larger quantity of fluid than usual was found in the ventricles.

## CASE XXIII.

An old man was admitted into the hospital for a complaint of giddiness and pain in his head. Upon examination, a tumour was perceived over the left parietal bone, into which an incision was made, and a good deal of matter discharged. The pericranium was found to be detached for three inches in length, and two in breadth. In the middle of the bare bone, which seemed to be dead, and really was so, granulations of a healthy appearance had sprouted out. These arose from the dura mater, and had made their way through the bone. The patient's health, which was moderately good at the time of his admission into the hospital, gradually declined; and, after about six weeks, the pain in his head became particularly severe. From this time he became gradually comatose, took no food, and soon died.

On dissection, the dura mater, beneath the carious bone, was found detached, and had granulated. Much pus lay between the left hemisphere of the brain and the falx; and the whole of the dura mater covering the right hemisphere was lined with healthy pus, which adhered to its surface, and appeared to have been secreted by that membrane.

The cases of diseased bone, which require perforation of the cranium, have not been sufficiently treated of by any English writer. Mr Pott has, indeed, noticed the disease and death of portions of the skull, that succeed to contusions; but he has not sufficiently explained the affections of the membranes of the brain, which even these diseases sometimes occasion. The circumstance, which seems particularly to have attracted his attention, is the inflammation and suppuration in the diploë, which proceed from injury done to the bone. The existence of that complaint, however, is easily known; for while there is a fixed pain in that part of the bone, there is no general inflammation, or but very little, of the dura mater. The disease continues, too, a much longer time without producing any seriously bad symptoms, than any disorder of the internal parts could do. When matter is formed in the diploë, the pericranium will certainly separate from the bone, and the external table of the skull will undoubtedly perish. In a case so clearly marked, the conduct to be pursued is obvious, which is, to remove a portion of the external table with the trephine, so as to discharge the matter collected in the diploë, without which no relief can be obtained. I have seen, in several cases, where the operation was performed early, that the external table came away within the circle of the trephine, the matter was discharged from the medullary part of the bone, and the internal table remained sound and entire, covering the dura mater. Granulations soon arose, and the patients got well.

with the exfoliation only of a portion of the outer table. The mischievous consequences of delaying the operation, when once the disease is known, must be evident; for the matter collected within the bone, having no natural outlet, will press on every side, first gradually destroying the diploë, sometimes extending itself over almost the whole of the cranium, and at last occasioning the partial absorption of both tables, so that the skull after death shall be found perforated with a number of holes, like a piece of worm-eaten wood. These holes afford a discharge to the matter, which not only oozes out beneath the pericranium, but also insinuates itself between the skull and dura mater; till at length the patient sinks, worn out by the irritation and fever which this painful and extensive disease creates; unless, as it sometimes happens, he is previously destroyed by inflammation attacking the membranes of the brain.

Suppuration of the diploë, and the death of a portion of the bone, are the common effects of injury done to the cranium; and such a morbid state may indeed occur at some distance of time from the receipt of the injury. But the disease, which the cases represent, generally arises without an obvious cause. An affection of the dura mater is almost the necessary consequence of such a disease in the bone. In syphilis it probably takes place later than in any other instance; for that disorder attacks the outside of the skull, which it gradually destroys; the inner table and the dura mater remain sound till the last. But when, as in the complaint I am now considering, the whole bone is involved in disease, we can no more expect that the dura mater should remain unaffected within, than that the pericranium should continue sound and attached without; for that membrane may be regarded as the periosteum to the internal table of the skull. It is well known that, in general, the

dura mater separates, and becomes thickened from a deposition and subsequent organization of coagulable lymph between its layers. This thickening is sometimes considerable, so as to form a tumour which causes an indentation in the cerebrum; as happened in a very remarkable degree in the case of the Sieur le Gallois, related by M. Louis.* Sometimes the dura mater secretes pus, which being confined within the cranium, produces inflammation of the brain, &c. At others, granulations arise from the irritated membrane, and, making their way through the bone, form those tumours so well described in the memoir just referred to. This took place in one of the cases I have related; and is a remarkable instance of the power which granulations possess of removing bone. The disease, however, does not confine itself to the part first attacked; for if the irritated state of the dura mater be not appeased, thickenings will take place in other parts of that membrane; or the inflammation becoming more extended, suppuration may be produced even over the opposite hemisphere of the brain, as happened in both the cases which I have related.

I do not mean to say, that in every case of diseased cranium, even where both tables of the skull are equally affected, the perforation of the bone is indispensably required. I know it often happens that the bone exfoliates, without any bad effects having been produced.

But surely no surgeon, who perceives the danger of delay, would hesitate to remove all the dead portion of bone, if symptoms denoting general irritation of the dura mater take place. The best event that can be expected, is, that the bone will at length ex-

* See Mem. de l'Acad. de Chirurg. tom. v. It also took place more slightly in one of the cases which I have related.

foliate without much pain to the patient, or injury to his constitution. By removing the dead bone, and giving an early and free discharge to any matter collected beneath it, the irritation which it occasioned will be taken away, the diseased state of the dura mater will gradually subside, and healthy granulations arise from its surface; nor will any further disease occur in other parts of that membrane. M. Louis tells us, at the conclusion of the memoir already quoted, in what manner experience had taught him to treat fungi of the dura mater. He says that "the whole of the tumour should be exposed, which "cannot happen till the bony circle which conceals "its basis, is removed; and that afterwards means "should be employed to destroy the fleshy excre-"scence."* Although the destruction of the fungus might be proper for the sake of expedition, and although it can perhaps be attended with no harm, by whatever means effected; yet it may not be necessary. Like other animal fungi, it will probably cease to grow, and soon disappear, when the irritation which occasioned it has been removed.

In cases of tumours rising from within the skull, it is of consequence to determine from what part they proceed. In general, they will be found to spring from the dura mater, and to be the effect of disease in that membrane, induced and kept up by irritation. Surgeons have endeavoured either to reduce them by caustic; to restrain them by pressure; or to take them off by a ligature or the knife: and the excrescences have either ceased or continued to grow, according as the irritation which gave rise to them

* The excellent effects of such bold but judicious practice are well shown in a case related in the 9th Paper of Haller's Disputationes Chirurgicæ, vol. i. in which a piece of diseased bone, six inches and a half in circumference, was removed.

has been removed or not. If the former happened, the surgeon has sometimes attributed undeserved merit to the means he had employed for the cure.

Those tumours which come from within the dura mater, may possibly differ in their kind in different diseases; and of these I have spoken in a former part of this essay.

What I have written must appear very defective, if it be considered as regarding the effects of injuries of the head in general. But my intention has been only to endeavour to illustrate particular points of practice, by a relation of cases selected from a considerable number of each kind.

I shall next relate a case, in which, though the brain was not the immediate subject of the injury, yet it became affected in consequence of it; and I think the case deserves to be recorded, not only on account of several useful facts and hints relative to practice which it affords, but also because it may eventually tend to throw light on the economy and diseases of the brain.

## CASE XXIV.

A man was gored in the neck by a cow. The horn entered by the left side of the cricoid cartilage, and penetrated as far as the vertebræ; it then passed upwards on the bodies of those bones, nearly as high as the bottom of the skull; afterwards it came out behind the angle of the jaw, exposing, and in some degree injuring the parotid gland in its passage, and lacerating the skin of the face as high as the middle of the ear. In its course it had passed beneath, and torn the internal carotid artery, and all the primary branches in front of the external carotid artery. The former vessel was not, however, entirely rent asunder, so that the general course of the artery, and its connex-

ion with the cranium remained in the usual state. Notwithstanding the size of the vessels which had been torn, they did not immediately bleed; the wound was therefore closed and bound up. The blood was soon observed to flow in streams down the neck, nor could any general pressure upon the wound prevent hemorrhage. In this state the man was conveyed to St. Bartholomew's Hospital, but he had lost a large quantity of blood before his arrival.

The patient was laid upon a bed, and before the wound was opened, one of the students firmly compressed the trunk of the carotid artery against the lower cervical vertebræ. We found upon the first inspection of the wound, that this pressure prevented any hemorrhage; yet upon the occasional motions of the patient, and upon accidental variations in the pressure made on the vessel, the blood gushed from the bottom of the wound so suddenly, and in such quantities, as to prevent any accurate examination. The man was very unquiet; he complained much of the pressure, and was greatly distressed by a sensation of suffocation, which compelled him constantly to attempt to expectorate. Under these circumstances our first endeavours were to tie the more superficial arteries; but the edges of the wound being lacerated, the first ligatures which we endeavoured to make tore away portions of the flesh, and did not secure the vessels.

The situation of the patient became every moment more desperate; he really seemed choking, his extremities became cold, and his pulse was scarcely to be felt: his struggles also, which could not be controlled, made the pressure on the trunk of the artery very precarious. It was deemed necessary to enlarge the wound to get at the trunk of the carotid artery, and an incision was made between that vessel and the trachea, in a direction parallel to each

of these parts. I had now the power of passing my finger beneath the trunk of the carotid artery; and of effectually compressing it between that finger and my thumb, which was placed opposite to it, upon the integuments of the neck.

I had now leisure to examine the wound with my other hand, and felt that the pharynx had been separated from the vertebræ of the neck, and had fallen against the larynx: the irritation of the latter organ was probably the cause of the sensation of suffocation which the patient suffered. There did not appear any reason to believe that the pharynx was wounded; for though the patient was constantly spitting, the mucus was not mixed with blood. Finding that the moment I remitted the pressure of the carotid, the blood gushed out from so many orifices, and in such a torrent from the bottom of the wound, I resolved to pass a ligature round the trunk of the carotid at the part where I had been compressing it, and which was about an inch below its division. This ligature I thought might be made to serve as the tourniquet in amputation, for I could with it compress the artery so as to prevent the wounded parts becoming obscured by blood, and by slackening it I might gain information with regard to the situation of the ruptured vessels.

Should it become necessary at any time to tie the carotid artery, I am convinced that it may be done without much difficulty or danger, even without an accurate dissection of the part. If the incision be made on that side of the artery which is next the trachea, where no important parts can be injured, as was done in the present instance, the finger can then be passed behind the artery so as to compress it. The vessel being sufficiently bulky and firm, to make its form and outline distinctly perceptible, a needle may then be passed behind the

artery, as near as possible to that edge of it which is next to the internal jugular vein: there can be little risk of wounding that vessel, or of including in the ligature the eighth pair of nerves which lies between them. In attempting to secure the carotid artery, I passed behind it, in the manner described, a blunt hook with an eye in the point, and having previously introduced a ligature into it, I drew back the instrument and thus inclosed the artery.

When I compressed the vessel by tightening the knot of the ligature, I did it slowly, and with a watchful attention to the sufferings of the patient; for I cannot but suppose that had the nerve of the eighth pair been included, his complaints would have sufficiently denoted that circumstance. But the compression of the ligature did not seem to make the least difference in the general state of the patient, whilst it completely prevented the further effusion of blood. With a knife and dissecting forceps I then exposed the lacerated vessels, and found that the primary branches of the external carotid artery had been torn off from the trunk. By drawing upwards the ligature which encircled the trunk of the artery, I made the internal carotid tense, so that its course and ruptured state could be distinctly felt. The ligature on the trunk was slackened, and the gush of blood further confirmed the laceration of the internal carotid artery. I had now the alternative of securing the ligature, which I had already made on the trunk of the vessel, or of tying the branches separately. I preferred the former, and it should be observed, that the man had now lain ten minutes or more without any blood being carried to the brain by the left carotid; and during that period he had recovered from his extreme faintness, appeared perfectly sensible, and as well as could be expected, considering that the person had lost so large a quan-

tity of blood. The ligature being now made secure, the wound was brought together by strips of plaster; and in this state warm milk was given to the patient to drink, in order to learn what would be the effect of his efforts to swallow, and to ascertain as far as possible, whether there was any wound in the pharynx or œsophagus. The patient swallowed about a quarter of a pint of this fluid with difficulty, and with the frequent excitement of coughing. No milk however came through the wound, and I concluded that all the difficulty of deglutition arose from the unnatural state in which the muscles of the pharynx were placed, in consequence of their detachment from the vertebræ. These circumstances happened between 4 and 5 o'clock in the afternoon, and when I saw the patient again between 9 and 10, his state seemed greatly amended. He had several times taken warm milk, and the difficulty of deglutition had abated. His pulse was now moderately full and strong, and not very frequent. It therefore appeared, that the apparently dying state of the man, which at one time had alarmed us, proceeded rather from the sudden discharge of blood, than from the quantity, however considerable, which had been lost. The patient also appeared tranquil, and perfectly rational, and though prevented from speaking much, he expressed himself satisfied in this situation.

On the whole I was led to form a favourable expectation of the progress of the case, as far as related to the effects which a ligature on one carotid would have on the economy of the brain. I was next morning mortified to learn, that the patient had been unquiet and feverish during the night; that he had become delirious; that he had been several times affected by slight convulsions, which had increased; and that when liquids were now given to him, they

passed through the wound, and he could scarcely swallow any thing. The pulse of the patient was now about 130 in a minute, and hard, and his skin was hot. He lay inattentive to external objects, but probably not insensible; for the pupils of his eyes were contracted, and when the lids were opened in order to examine them, he shut them quickly, and, as it were, impatiently. It had been remarked, that the left side of the body was more convulsed than the right.

As we had it not in our power easily to give medicine, I introduced a small hollow bougie through the right nostril into the œsophagus, and immediately injected half a pint of milk and water, and 60 drops of tincture of opium; that I might learn the effects of that medicine under the present circumstances. The patient shortly after broke out into a most profuse sweat, and the convulsions were quieted by the opium. The convulsions, when thus mitigated by opium, might be described as violent tremors of the left side of his body, but the right side remained motionless; to which curious fact I particularly attended. I placed his right arm across his breast, from which situation it did not afterwards stir. I could not, however, perceive any distortion of the face to the opposite side, and the pupils of both eyes were equally contracted. When I saw the sweat break out on the taking of opium, and the nervous irritation diminish by its operation, I was then more forcibly struck than I had been before with the similarity of this patient's situation, to that of a person suffering from the effects of concussion of the brain, some time after the accident, when the inflammation often succeeding to it had begun to take place.

I even questioned if it might not be right to take blood from the temporal artery, which was seen

beating violently. I thought, however, the general opinion would be against such practice, and I only applied a blister to the head. Twenty drops of tincture of opium were directed to be given to the patient every third or fourth hour, with a view to mitigate the convulsions, which it appeared to do. Milk and water was also occasionally given, in proportion to the degree of perspiration. No remarkable change of symptoms took place, but the strength of the pulse gradually declined, and at 10 o'clock at night he had a severe convulsion fit, and immediately after died. His death happened about thirty hours after the ligature had been made on the carotid artery.

The body was examined on the following day. The brain appeared to have suffered a considerable degree of inflammation. The vessels of the pia mater appeared as if they were injected, and in many places upon the surface of the convolutions of the cerebrum, there even seemed an effusion of blood producing that appearance usually termed blood-shot. There was a very considerable deposition of gelatinous substance between the tunica arachnoidea, and the pia mater. The vessels passing through the substance of the brain, though fuller than common, were not particularly turgid. A considerable quantity of water of a light brown colour, and slightly turbid appearance, was found in the ventricles, whilst the firmness of the sides of those cavities sufficiently indicated that the collection had not preceded the accident. On examining the neck, the carotid artery was found to be the only part included in the ligature. The superior thyroideal, lingual and fascial branches of the external carotid, were torn off from the trunk, and the internal carotid was rent across, as has been already mentioned.

Neither the trunk of the eighth pair of nerves, nor the great sympathetic, nor those of the tongue, ap-

peared to have suffered injury. The superior laryngeal, and the descending branch of the ninth pair, were the chief nerves injured by the accident. These circumstances are mentioned to enable the reader to form his own judgment on the probability of the symptoms which occurred being produced by nervous injury or irritation.

That the disorder and death of this man are not to be attributed to the quantity of blood which he had lost, appears clearly to me, not only from the degree of plenitude and power of the vascular system which remained, but because I had seen many patients in the hospital, who had divided most of the primary branches of the external carotid artery in the attempt at suicide; and who, after surviving a few days, perished in consequence of the loss of blood which they had sustained, but with a train of symptoms very different from those which occurred in the present instance.

Some persons may, perhaps, be inclined to attribute inflammations of the brain to nervous injury or irritation. I have taken notice of all the injury discoverable by dissection, and have further to observe, that we frequently see larger nerves lacerated in wounds without the production of such symptoms; and the tranquil state of the patient, till the inflammation of the brain came on, opposes such an idea. Upon reflection, I can form no other opinion of the case than that which first struck me, which is, that though the stopping the supply of blood to the brain did not for several hours produce any apparent derangement in the functions of that organ, yet such a state was gradually occasioned by it, and which was attended, like the effects of concussion of the brain, with inflammation. It further appeared, that when the combined effects resulting from the derangement, and the inflammation were manifested

together, the state of the patient much resembled that of a person who had suffered concussion. Miasmata which impair and disturb the energies of the brain, occasion fever and inflammation of that organ; so that there appears to me nothing wonderful in the inflammation which occurred in the present instance. It is right, however, to mention, that the carotid artery has been since tied in this city, by Mr. Travers, without such effects as I have described taking place.

Mr. Travers has obligingly communicated to me the following particulars of this case, which I here insert:

" The case to which you refer, I consider to be " an example of the disease which Mr. J. Bell has " denominated Aneurism by Anastamosis. It was " a tumour, resembling the Nævus, of a livid co- " lour, and compressible, projecting from the orbit, " pulsating formidably, and gradually working the " eye out of its socket. Pressure aggravated the " pulse, and gave insupportable pain. In examining " it, I put my thumb on the carotid of the same side, " and the pulse instantly ceased. Seeing that it grew " fast, I prevailed on the patient, a woman of eight- " and-thirty, to allow me to tie the common carotid " artery, which I did last May twelvemonth. She " suffered nothing more than I have usually seen " follow other operations for aneurism, and was " abroad at the end of a month. The tumour ceased " to pulsate, but for some time retained a vibratory " thrill, which it has since totally lost. It likewise " shrunk to about half its former size, and became " solid and incompressible, in which state it has " since remained. I may also add, that the patient " was greatly afflicted with pain in the head prior " to the operation, and that it has completely re- " moved that pain."

The different states of the two sides of the body, in the case which I have last related, ought not, I think, to pass without further notice. Although the right side could not be positively said to be paralytic, yet, in my opinion, it approached to that state.

It has been already observed, that a double construction might be put upon the symptoms; yet as the inflammation of the brain was equal on both sides, we might naturally expect the whole body to suffer equally. Should the state of the right side have been, as appears most probable, an approach to a state of paralysis, it must surely be considered as peculiarly curious. An effusion of blood in the left hemisphere of the brain would affect the opposite side of the body in the same manner, that cutting off the supply of blood to the left side appears in this instance to have done. I forbear to speculate on this subject: the fact which I have mentioned seems to deserve notice, and though at present it must stand alone, it may receive future confirmation, and when thus supported, be applied to the elucidation of physiology.

I have thought it right to record this case, not merely because it is curious, but because it affords some useful practical hints, as to the conduct to be pursued when a person has divided the large primary branches of the carotid artery in an attempt at suicide. It may be allowable also to mention, in relation to this latter subject, the great advantages which appear to me to arise from the immediate introduction of a small elastic catheter, passed through the right nostril, down the œsophagus, nearly as far as the stomach, (in the manner practised by Desault, in the cure of a person wounded by a pistol ball,) when the pharynx or larynx are injured.

A patient in such a state is not under the necessity of frequently swallowing nourishment, which

act tears open the wounded parts, and causes inflammation in them, and produces such a secretion of mucus as excites almost constant cough, increasing the disturbance of the wounded parts.

The introduction of a small elastic catheter may be easily accomplished in the first instance, though not without difficulty, after the sensibility of the parts has been increased by inflammation; and from the benefit I have seen derived from it I should not hesitate to do it in all cases of extensive wounds of the throat.

# SURGICAL OBSERVATIONS.

## *On the ill Consequences sometimes succeeding to Venesection.*

THE public is much indebted to Mr. Hunter for a judicious account of the appearance and effects of the inflammation of the vein, which sometimes succeeds to venesection. The ill consequences which occasionally follow that operation are numerous and dissimilar; and they have never I believe been clearly and collectively stated and explained. The cases recorded of such complaints are dispersed in various periodical publications; and frequently, the nature of the disease appears not to have been understood by the person who relates its history. In proportion as I have seen more varieties of these diseases, my own knowledge of them has become more clear and simple; and as I believe, I can communicate useful information, I have ventured to offer to the public the following observations and opinions. I have been also incited to this task, because the account in his System of Surgery, which Mr. Benj. Bell has given of these complaints, appears to me confused; and the practice recommended improper. I am hurt to censure the works of any author, but this either must be done, or injurious error must remain uncontradicted.

When from want of attention, or from other causes, the wound inflicted in venesection does not

speedily unite, the motions of the arm occasion attrition of its sides against each other, and inflammation of the wounded, or contiguous parts is likely to ensue. I shall give a brief account of these different complaints, in the order in which I believe they most frequently happen.

### *Of Inflammation of the Integuments, and subjacent cellular Substances.*

The inflammation and suppuration of the cellular substance in which the vein lies, is the most frequent occurrence. Of this every surgeon must have seen repeated instances; they may also have remarked, that on the subsidence of this inflammation, the tube of the vein is free from induration: neither does the state of any of the surrounding parts indicate their previous participation in the disease. The nature of every excited inflammation will vary as the cause which produced it, and the constitution of the patient shall determine; it will therefore be unnecessary to particularly notice the varieties of its appearance. Sometimes the inflammation will be more indolent, and will produce a circumscribed and slowly suppurating tumour. Sometimes it will be more diffused, partaking more of the nature of erysipelas: and sometimes its violence, and rapid termination, will evidently distinguish it to be a phlegmon.

If the lancet with which the patient was bled should have been bad; if it lacerated rather than cut the parts through which it passed; if the constitution of the patient be irritable; and more particularly, if sufficient attention be not paid to procure the union of the divided parts, but the motion of the arm be allowed: the irritation, which the friction of the op-

posite edges of the wound must occasion, will most probably excite inflammation. The treatment proper to be pursued in this complaint is manifest, and distinguished by no peculiarity; I shall therefore postpone what I have to say on that subject, until I have noticed the other varieties of these diseases.

### *Of Inflammation of the absorbing Vessels.*

The next frequent complaint which I have seen is inflammation of the absorbents: it however sometimes accidentally happens, that one surgeon meets with many cases of a similar nature, so that were he to judge merely from his own observation, he might conclude that disease to be common, when the collected experience of others would determine it to be a rare occurrence. I am inclined to suspect, that my observation has been thus partial, since Mr. Hunter has not publicly noticed this complaint. I think I cannot give a better history of the commencement, appearances, and event of this disease, than by relating three cases, of the circumstances of which I took an account. It is right, however, to mention, that I have seen two others, of which I took no minutes; and which I am unwilling to relate only from recollection.

#### CASE.

A lady was bled in the vena mediana basilica; the wound did not heal, nor was sufficient attention paid to preserve the arm quiet. Eight days afterwards, I was consulted, in consequence of the patient being alarmed, by the appearance of two swellings; one was situated about the middle of the arm, over the large vessels, the other on the fore-arm, about the

mid space between the elbow and wrist, in the integuments above the flexor muscles. The upper swelling measured rather more in circumference than an egg, the other was of smaller dimensions; they were not very painful, they were moderately firm in their texture, and so exactly resembled those tumours which form round irritated lymphatics, that no doubt could be entertained of their nature. The orifice made by the lancet was not healed, the integuments for about one fourth of an inch surrounding it, were in a slight degree inflamed, and thickened. No induration of the venous tube could be distinguished, either at this time, or after the subsidence of inflammation.

The account which I obtained from the patient, of the attack of this complaint, was, that the wound inflamed, became painful, and discharged matter; that the gentleman by whom she was bled had dressed it with salve, but did not restrain her from using her arm; that about five days after the operation, she had felt pains shooting from the orifice, in lines, up and down her arm, and upon pressing in the course of this pain, its degree was increased. This account induced me to examine the arm attentively, and I could plainly feel two indurated absorbents, leading to the superior tumour, but could not perceive any extending to the lower one. The wounded part was dressed with mild salve; a bread and milk poultice was applied to both tumours, and the arm was supported by a sling, and retained without motion or exertion. The integuments surrounding the orifice lost their disposition to inflame, and the wound gradually healed; during five days, the tumours underwent no evident alteration; the poultice was changed to one of bread, water, and a solution of acetate of lead, under which they quickly diminished and dispersed.

CASE.

A man about 35 years of age, was admitted into St. Bartholomew's Hospital, under the care of Mr. Pott: he had been bled in the country, about a fortnight before his admission; since that time he had been extremely ill, and was with difficulty conveyed to London. The state in which he was admitted, I shall describe: His whole arm was greatly swollen, the wound made by the lancet was not united, the parts immediately surrounding it did not seem to be affected by distinct inflammation; but partook of the general tumefaction. Two large abscesses had formed, one situated near the inner edge of the biceps muscle, about the middle of the arm; and the other, on the inside of the fore-arm. The patient told us that he been bled, on account of a pain in his side; that the orifice, instead of healing had festered, that he had for a time pursued his daily employment, notwithstanding the pain which he suffered; that this, however, soon became too violent to be endured; the swelling and pain extended towards the armpit, where the glands became enlarged. Inflammation next attacked the fore-arm, and after suffering extreme pain and fever, these abscesses had formed, and since that time his illness and pain had in some degree abated. Mr. Pott opened both abscesses, and directed his whole arm to be covered with a poultice. The patient was kept in bed, and medicines likely to alleviate inflammation were prescribed. In about four weeks, the arm was reduced nearly to its natural dimensions. The orifice, through which he was bled, had united, and the wounds by which the abscesses had been opened were nearly healed. The parts surrounding them, however, still remained thickened, and also all the integuments on the in-

side of the arm. In these thickened integuments, three chord-like substances, evidently absorbents, were to be distinguished; they extended from the superior abscess, and again above this, two were continued even to the axilla. Two other indurated absorbents also were extended from the punctured part to the inferior abscess. The punctured vein being attentively examined, was found to be a little thickened, both above and below the orifice; it had, however, no connexion with these chord-like substances, which were superficial, and their appearance, course, and every other circumstance, clearly showed them to be indurated absorbents. The hardness of these vessels, and of the integuments had much diminished, and the patient had regained the strength of his arm, before he was discharged from the hospital.

CASE.

A poor man was bled, in one of the bleeding-shops of this city. His operator dipped some rag in the blood which he had taken, applied it to the orifice, and bound it on the arm with a tape. The patient felt much pain in the wound, even from the time of the operation, and experienced much difficulty in moving his arm. As the rag stuck closely to the orifice, he was unwilling to remove it; however, on the third day, the violence of the pain induced him to take it off: he then found the parts surrounding the puncture inflamed and hardened. The patient had also suffered much pain, which extended towards the axilla, and one of the glands there was swollen. He anointed the arm with some ointment, but the pain so increased, that he could scarcely bear it to touch his side. The integuments about the middle of the arm were elevated by a tu-

mour, which was painful when pressed; the base of it was not circumscribed, but was gradually lost in the surrounding parts. In this situation he requested my advice. I gave him some mild salve to dress the wounded part; I directed him to keep constantly applied to the integuments, covering the inflamed lymphatics, some cloths wetted with the cold solution of acetate of lead, to keep his arm completely supported by a sling, and to take some gently purgative medicine.

This he did, the inflammation gradually subsided, and the wound made by the lancet healed.

It might be suspected, that in the cases which have been related, the lancet which was employed was envenomed; and that the absorption of virulent matter was the exciting cause of inflammation: the descent of the disease to the inferior absorbents, in the two first cases, opposes that opinion; and it is further invalidated by the observations which I shall proceed to offer. Since the structure and functions of the absorbing vessels have become so well known, the attention of medical practitioners has been directed to their diseases, and much novel information has been acquired. That which relates to the present subject, I shall endeavour briefly to state. Physiology shows to us, that the absorbents possess much sensibility. Practical observation strengthens this opinion: the celerity with which these vessels inflame, when they have imbibed noxious matter, and the pain which is suffered in consequence, sufficiently prove this circumstance. Their frequent inflammation, in consequence of disturbance of the general constitution, may be however regarded as an additional argument. A common cold produces a painful tumefaction of the absorbent glands; and in some fevers, these parts are particularly obnoxious to disease.

There is another circumstance, which deserves attention; when the absorbents become inflamed, they quickly communicate this disease to the cellular substance, by which they are surrounded. Most surgeons have remarked these vessels when indurated, to appear like small chords, perhaps of one-eighth of an inch in diameter; this substance is surely not the slender sides of the vessel thus suddenly augmented in bulk, but an induration of the surrounding cellular substance, to which the irritated vessel has communicated inflammation. The formation of a common bubo is another instance of the power, which these vessesl possess, of involving the surrounding parts in their disease; at first one or two glands are found to be inflamed, but they soon become undistinguishable, in the general inflammation of the surrounding substance. This inflammation either is dispersed, or it terminates in suppuration: and on the subsidence of the general tumour, the originally diseased glands again become distinguishable.

I now wish to show, that their inflammation, in consequence of local injury, is deducible from two causes: one, the absorption of acrid matter; and the other, the effect of irritation of the divided tube. Of the inflammation arising from the absorption of morbific matter, every one is apprized; but that which is the effect of irritation, has been less remarked.

When virulent matter is taken up by the absorbents, it is generally conveyed to the next absorbent gland; where, its progress being retarded, its stimulating properties induce inflammation; and frequently no evident disease of the vessel through which it has passed can be distinguished. The absorption of syphilitic and cancerous matter affords

frequent proofs of this assertion. There are, indeed, some poisons so acrid, that the vessel which admits them inflames throughout its whole extent; yet still the glands are principally affected. When inflammation of the absorbents happens in consequence of irritation, that part of the vessel nearest the irritating cause generally suffers most: whilst the glands, being remotely situated, partake less of the inflammation. The inflammation is also of a different kind, and, I think, can be discriminated: when it arises from poison arrested in the part, the gland is first indurated, and a phlegmonoid inflammation follows; but if irritation be the cause of its enlargement, the tumefaction more speedily takes place, the gland is more painful in its early state, but has less tendency to suppurate; the enlargement more resembles that of the lymphatic glands of the neck, which is the consequence of taking cold.

When the inflammation arises from irritation, it will be expected, and I believe it will be found, that the continuity of the vessel will be apparent: but it does not follow, that the greatest disease will be immediately adjoining that part which has sustained the injury. The cases which have been related show that inflammatory tumours often form in the middle of the arm and forearm, when the wound of the absorbent is at the bend of the elbow. Were it necessary, I could relate several cases where such tumours were formed from injuries done to the fingers, or in consequence of fretting ulcers of the leg. When they arise from the latter cause, it might be supposed that some acrid matter had been imbibed; yet, I think, in that case, we should find the glands the principal seat of the disease. It has been proved, that the absorbents frequently inflame far below the part where the vessel has sustained an injury, and where

the inflammation could not be occasioned by absorption. These observations I thought it right to insert, to illustrate the cases which have been related; and also to excite more general attention to the diseases of these important vessels.

## *Of Inflammation of the Vein.*

After the account which Mr. Hunter has given of the inflammation of the vein, (in the Medical and Chirurgical Transactions) no additional information from me will be expected, nor is it perhaps required. If the wound of the vein does not unite, an inflammation of that vessel will probably follow; which will vary in its degree, in its extent, and in the course which it pursues. One degree of inflammation may occasion only a slight thickening of the venous tube, and an adhesion of its sides; more violent inflammation may be attended with the formation of more limited, or more extensive abscesses; the matter of which may sometimes mix itself with the circulating fluids, and produce dangerous consequences: or it may be circumscribed by the thickening and adhesion of the surrounding parts, and then like a common abscess make its way to the surface. When the inflammation of the venous tube is extensive, it is, indeed, very probable, that much sympathetic fever will ensue; not merely from the excitement which inflammation usually produces; but also, because irritation will be continued along the membranous lining of the vein to the heart. If, however, the effect of the excited inflammation has luckily been to produce adhesion of the sides of the vein, at some little distance from the wounded part, the inflammation will here cease; its further transmission will by the adhesion be prevented. The effect of

adhesion of membranes, in preventing the extension of inflammation along their surfaces, is frequently apparent, and has been well explained by Mr. Hunter on another occasion. In one case, Mr. Hunter applied a compress on the inflamed vein, above the wounded part, and he thought that he succeeded in producing adhesion, for the inflammation extended no further. In those cases, where the inflammation does not continue equally in both directions, but descends along the course of the vein, it is probable that its extension in the other direction is prevented by adhesion.

I have thus briefly and imperfectly transcribed Mr. Hunter's opinion, that the present Essay might not be altogether deficient in information relative to this subject. I have seen but three cases where an inflammation of the vein succeeded to venesection; they, however, confirm the foregoing observations. The vein did not in either case evidently suppurate. In the first, about three inches of the tube inflamed both above and below the orifice; it was accompanied with much tumour, redness, and pain of the covering integuments, and much fever; the pulse was rapid, and the tongue furred. After the inflammation had terminated, and all tumour had subsided, the vein did not swell when compression was made above the diseased part. The second case was of a similar nature, but less in degree. In the third case, the inflammation was not continued in the course of the vein towards the heart, but extended as low as the wrist. I have no doubt, but that adhesion of the sides of the vein was the cause which prevented the extension of the disease, equally in both directions. The nature of a disease being known, the treatment is commonly evident. The diminution of inflammation in a vein is to be attempted by the same general means as in other parts. As the membranous lining

of the vein is continued to the heart, and as inflammation very speedily spreads along such surfaces, unless prevented by adhesion; the application of a compress at some distance from the punctured part, in order to unite the inflamed sides of the vein appears to be particularly judicious.

I am induced to suppose, a case may occur in which the vein may suppurate, and in which a total division of the tube may be proper practice; not merely to obviate the extension of the local disease, but to prevent the collected pus from mixing with the circulating fluids.

### *Inflammation of the Fascia of the Fore-arm.*

As far as my observation has extended, the next frequent ill consequence which succeeds to venesection performed in the arm, is an inflammation of the subjacent fascia. When this complaint occurs, it perhaps arises not merely from the contiguity of the fascia to the punctured and irritated parts, but it is probable that it was wounded by the lancet in the operation. I hope that the cases which I shall relate, and those to which I can refer the reader, will convey sufficient information of the symptoms and effects of this disease.

#### CASE.

A man, aged 40, was admitted into St. Bartholomew's Hospital, under the care of Mr. Pott: he had much pain and difficulty of moving his arm, in consequence of inflammation succeeding to phlebotomy. The wound inflicted in the operation was not healed; the surrounding integuments were not much inflamed, but he could neither extend his fore-arm nor

his fingers without great pain. The integuments of the fore-arm were affected with a kind of erysipelas; when slightly touched, they were not very painful, but when more forcibly compressed, so as to affect the inferior parts, much pain was suffered. The patient complained of pain, extending towards the axilla, and also towards the acromion, but no tumour of the arm in either direction was perceptible. A poultice was applied to the arm, opium was given at night, and aperient medicines were occasionally prescribed. The pain in the arm increased, and it was attended by much fever. After a week had elapsed, a small and superficial collection of matter took place a little below the internal condyle; this being opened, but little pus was discharged, and scarcely any decrease of tumour or pain followed. About ten days afterwards, a fluctuation of matter was distinguished below the external condyle; an incision was here also made, which penetrated the fascia of the fore-arm. Much matter immediately gushed from the wound, the swelling greatly subsided, and the future sufferings of the patient were comparatively of little consequence. This opening was, however, inadequate to the complete discharge of the matter, which had probably been originally formed beneath the fascia in the course of the ulna; its pointing at the upper part of the arm, depended on the tenuity and comparative non-resistance of the fascia at that part. The collected pus descended to the lower part of the detached fascia, a dependent opening for its discharge became necessary, after which the patient recovered, without any circumstance being observed worth relating. The case which I have just related, and that in which two large abscesses had formed, attended with indurated absorbents, occurred nearly at the same time at the hospital, and they both fell under the care of Mr. Pott.

In the lectures of that eminent surgeon, I had heard dangerous and fatal consequences attributed to the injury of a nerve in venesection, but I learned no other distinction of cases. These cases first excited my attention to this subject, and as far as I know, such discrimination as that which I now offer to the public has not been attempted.

I have seen one other case of inflamed fascia, but I neglected to take notes of the symptoms; I therefore can only say, that at the time they appeared so clearly to characterize it, that I entertain no doubt of its nature. No inflammation of the vein or absorbents appeared, the integuments were not much affected, but the patient complained that his arm felt as if bound or compressed, and that he suffered much pain if he attempted to extend it. The inflammation subsided without the formation of matter; and after much time had elapsed, the pliability of the arm was gradually regained. I the less regret my deficiency of experience on this subject, as I can refer the reader to the second volume of the Medical Communications; he will there meet with two cases, which I believe he will acknowledge to be inflammations of the fascia; attended, however, with some peculiarity of symptoms.

The first case is related by Mr. Colby of Dorrington, in Devonshire; the other by Mr. Watson. The inflammation of the fascia, in the latter case, was followed by a permanent contraction of the fore-arm. From this case, I think we have acquired useful knowledge: should a similar contraction of the fore-arm from a tense state of the fascia in future occur, it seems reasonable to suppose, that it may be completely relieved by detaching the fascia from the tendon of the biceps, to which it is naturally connected. This, I conclude, was the cause of the perfect restoration of free motion, in the case first rela-

ted by Mr. Watson. On this subject I will not enlarge, but submit the opinion to the judgment of the reader.

The treatment of an inflamed fascia, the consequence of venesection, has in it no peculiarity. Doubtless, those general means which are reductive of inflammation should be employed. Of local treatment, quietude of the limb, and a state of relaxation of the inflamed part, will tend to lessen disease; but as soon as some abatement of inflammation is procured, the extension of the forearm and fingers ought to be attempted, and daily performed, to obviate that contraction which might otherwise ensue.

## *Of the ill Consequences succeeding to a wounded Nerve.*

In order to complete, in some degree, this Essay, I have attempted to discuss the present subject; though, I acknowledge, I have no practical information to communicate. I believe these accidents to be of rare occurrence, since those of my medical friends, to whom I have applied for information, had never seen a case, the symptoms of which they could decisively pronounce to arise merely from an injured nerve. Mr. Pott in his lectures used to say, that he had seen two cases, in which the patients had suffered distracting pain, which was followed by convulsions, and other symptoms which could only be ascribed to nervous irritation. He attributed these effects to a partial division of the nerve, and recommended its total division as a probable remedy. Dr. Monro, I am informed, relates similar cases, in which such treatment has proved successful. I rely on the discrimination of these eminent men, yet I feel convinced, that the greater number of surgeons

have been deficient in distinguishing these diseases. A wounded nerve, acting as a cause, must always produce specific and characteristic symptoms and effects. I need not insist on the necessity of discrimination in these complaints; those who have described the symptoms resulting from an injured nerve, have represented them as at all times imminently hazardous, and frequently fatal. An operation is here demanded; from it we have reason to expect immediate mitigation of the patient's sufferings, and his future perfect restoration. Yet this operation in any other of the complaints before treated of would be unnecessary, and perhaps detrimental.

I shall arrange what I have to say on this subject in the following manner: First, I shall explain what nerves are subject to injury; secondly, I shall investigate what are the effects likely to be produced by such an accident; and thirdly, I shall inquire, what means are most likely to afford relief.

First, The two cutaneous nerves are those which are exposed to injury. I dissected them in several subjects with attention, and found some irregularity in their distribution; most frequently all their branches pass beneath the veins, at the bend of the arm; but sometimes, although the principal rami still go beneath these vessels, many small filaments are detached before them, which it is impossible to avoid wounding in phlebotomy. As I believe many surgeons retain but an indistinct remembrance of these nerves, and as I have never seen them accurately depicted, in any anatomical book, I thought I should do an acceptable service, by giving an engraving of them. I therefore made two drawings of them: one exhibiting their most simple course; the other, their most complicated distribution. These, I conclude, are the only nerves liable to injury. It may be

suspected, that the median nerve might occasionally be wounded; but its situation, I think, makes this opinion improbable. If, however, a doubt should be entertained on this subject, an attention to symptoms will soon dispel it. When a nerve is irritated at any part between its origin and termination, a sensation is felt as if some injury were done to the parts which it supplies: if, therefore, the cutaneous nerves were injured, the integuments of the forearm would seem to suffer pain; but if the median nerve was wounded, the thumb and two next fingers would be affected with pain.

By referring to the plate, it will be seen, that if the patient be bled in the vena mediana basilica, the branches of the internal cutaneous nerve are exposed to injury; or, if the vena mediana cephalica be opened, the branches of the external cutaneous nerve may be wounded.

Secondly, I wish to inquire what are the ills likely to arise from a wounded nerve. Whoever reflects on the wonderful minuteness of the nervous fibrils, and considers their perfect distinctness from each other, although connected by a common covering of cellular substance, will scarcely imagine a partial division of a nervous fibril. If I sought to express myself strictly on this subject, I should speak of a partial division of a packet of nerves. But I shall use the commonly adopted language, and call those chords nerves, which are really composed of multitudes of separate nerves. I first beg leave to examine the opinion which has prevailed, of a nerve being partially divided. Admitting that a nerve be partially divided, would it not, like a tendon, or any other substance, unite? I think there can be no doubt but that it would. I am induced to this opinion, by considering, that nerves of equal size with the cutaneous nerves of the arm are distributed in

considerable numbers throughout the body. In the many operations performed, and in the wounds daily occurring, I think it would be strange if a partial division of a nerve should not happen; yet no peculiar symptoms are observed usually to ensue. The pain which some people suffer from bleeding, in my opinion, indicates an injury done to a nerve. If the reader refers to the plate, he will perceive, that in some cases it is impossible to avoid dividing branches of nerves in phlebotomy, as sometimes they pass before the vein. These branches are so exposed, that I should be surprised if they did not many times suffer a partial division. Surely, however, a half divided nerve would unite without causing a general derangement of the nervous system. Yet it is possible that an inflammation of the nerve may accidentally ensue, which would be aggravated, if it were kept tense, in consequence of imperfect division. In the cases related by Mr. Pott and Dr. Monro, I believe, that some days elapsed after the infliction of the injury, before any alarming derangement of the nervous system ensued. Inflammation of the surrounding parts also appeared. These observations make it evident to me, that the disease consists in inflammation of the injured nerve, in common with the other wounded parts; and this inflammation, I can conceive, to happen with or without a total division of the nervous chord. I should consider a case of inflamed nerve as an object of great curiosity. Every one, I think, will admit, that it is likely to communicate dreadful irritation to the sensorium; and every one will perceive, that a cure will probably arise from intercepting its communication with that important part.

Thirdly, I proceed to inquire what is the most probable method of relieving the effects arising from an inflamed nerve. The general opinion is, that the

nerve is only partially divided, and that a total division would free the patient from a continuance of his sufferings. Mr. Pott supposed that the wounded nerve was situated at one or the other extremity of the wound which had been made in the vein; he therefore proposed to divide it totally, by enlarging a little the original orifice. It is however possible, that the point of the lancet might injure a nerve lying beneath the vein. This will be easily understood by referring to the plate. Mr. Bell directs an extensive transverse incision, to be made through the original wound; but if the injured nerve be situated at the upper extremity of the orifice, it will remain unaffected by this operation. Mr. Bell also advises the incision to be continued to the bone; but this appears to me dangerous and unnecessary.

If the injured nerve be inflamed, I think it doubtful, whether even a total division of it, at the inflamed part, would effectually relieve the general nervous irritation which the disease has occasioned. To intercept the communication of the inflamed nerve with the sensorium, does however promise perfect relief. This intention can only be accomplished, by making a transverse incision above the orifice in the vein. The incision need not be very extensive, for the injured nerve must lie within the limits of the original orifice, and it need only descend as low as the fascia of the fore-arm; for all the filaments of the cutaneous nerves lie above this fascia. The vein which had been opened, and some filaments of the cutaneous nerves, are all the parts of consequence which will be divided in this operation. The proximity of the division of the nerve to the vein, must be regulated by the supposed extent of the disease. However, as the extent of the inflammation of the nerve is uncertain, I submit it to the consideration of surgeons, whether it may not be adviseable, in

some cases, to divide either of the cutaneous nerves, still more remotely from the injured nerve.

I find little difficulty in detecting the trunk of these nerves in the dead subject, and I should suppose but little would occur in the living state; for the compression of the tourniquet would prevent any obscurity which hemorrhage might cause.

*General Observations on the ill Consequences sometimes succeeding to Venesection.*

I think it very probable that these diseases would less frequently happen, did not the situation of the veins usually opened contribute to their occurrence. The common offices of life so constantly demand the employment of the arm, that its motion becomes almost inevitable. Unless the orifice made by the lancet has been attentively closed, the effect of this motion will be to separate the edges of the wound from each other, and to prevent their union by the first intention. Some slight degree of inflammation will ensue; the continuance of motion of the arm causes a friction of the inflamed surfaces against each other, and thus the disease is increased. Under these circumstances, if the constitution of the patient be irritable, the inflammation will extend itself, although it may still be confined to the cellular substance, and integuments; or, perhaps, it may be transmitted to that part which has sustained most injury in the operation. The vein, the absorbents, the fascia, or the nerve, may in that case suffer peculiar disorder. Although the injury done by a bad lancet may contribute to the production of disease, yet I think it probable, that a patient improperly bled, would sustain no injury, if the treatment of the wound was judicious; whilst another, on whom the operation had been dexterously and well performed, would be liable to these ill consequences, if the proper attention to unite the wound was neglected.

In the account given of these diseases, they have been represented as they occurred separately; doubtless, in some cases, they may be combined.

The principal curative indications appear to be, to mitigate the inflammation about the orifice, and to preserve the arm supported in a motionless state. I need not enlarge this account, by describing the modes of appeasing inflammation and irritation, as they are well known to every surgeon.

face Page 105

*Explanation of the Plate.*

A Vena basilica.
B Vena cephalica.
C Vena mediana.
D Vena radialis.
E Vena cubitalis.
F Vena mediana basilica.
G Vena mediana cephalica.
H Nervus cutaneus internus.
I Nervus cutaneus externus.

# SURGICAL OBSERVATIONS.

## ON EMPHYSEMA.

MUCH praise is, in my opinion, due to Mr. John Bell, for the clear and spirited description which he has given of the state of the lungs in one kind of emphysema. The following case is related, to corroborate his remarks, and also to lead to others which I am desirous of offering to the public on the subject of emphysema in general.

### CASE.

A poor woman, about forty years of age, was run over by a mail-coach, one of the wheels of which passed lengthwise over her back, and fractured several of her ribs on the right side. When brought to the hospital, she breathed with much difficulty, and an emphysema of the integuments had taken place. An opening was made through the skin to let out the air; and the emphysema did not afterwards spread. The patient was bled largely; but the difficulty of breathing had increased to the third day, at which time I first saw her, in company with Mr. Harvey, under whose care she was. She had passed the preceding night without the least sleep, and breathed at this time with extreme difficulty; indeed it seemed as if she could not long continue the la-

bour of such imperfect and distressful respiration. It was supposed that one side of the thorax was filled with air; and as it was suspected that the opposite lung might be oppressed by this cause, it was agreed to extract the air from the right side of the chest. With this view, Mr. Harvey made an opening into the thorax, in the following manner: He first made an incision, about two inches in length, through the integuments, near the middle of the seventh rib, and opposite to its lower edge. He then drew the skin upwards, so as to expose the intercostal muscles which connect the upper edge of this rib to the one above it. These he cautiously divided, as he next did the pleura. At the time this was effected, I believe the patient was in the act of expiration; for a blast of air evidently issued from the thorax; and afterwards, whilst the integuments were kept retracted, and the aperture in the pleura consequently uncovered, the external air continued to rush in during the enlargement of the thorax, and to be forced out again during its contraction. But when the divided skin was allowed to descend to its natural situation, and thus the opening of the pleura was covered, no farther passage of air took place; and all that could then be perceived, was a depression of the integuments opposite to the aperture in the thorax, occasioned by the pressure of the atmosphere, during the enlargement of that cavity. I had got ready a large injecting syringe, and introducing the pipe into the cavity of the chest, I drew up the piston, and thus exhausted the air, till I found I was stopped from proceeding by the lung which had risen up and applied itself to the mouth of the syringe. The skin was then immediately brought down over the aperture in the thorax, and served like a valve, to prevent the further ingress of air into that cavity. About ten ounces mea-

sure of air might probably have been extracted by the syringe. As this quantity of air could have occupied but a small space when compared with the size of the thorax, it was probable that the back part of that cavity was filled with fluids.—Nothing further, however, was done at this time; and shortly after the poor woman fell asleep, and breathed with comparative ease for nearly six hours. But the difficulty of breathing again increased during the night, and at noon, on the following day, was nearly as great as ever. Mr. Harvey and I agreed, however, that it would not be wrong to inspect the thorax, to see if the lung had collapsed, or if we could by any means afford relief to the patient. Upon separating the adhesion which had formed between the skin and subjacent parts, and introducing a finger through the aperture in the pleura, we found the lung adhering to the inside of that membrane; but upon slightly varying the patient's posture, some turbid bloody serum flowed from beneath the lung. When we had discharged as much of this fluid as we conveniently could, the external wound was closed; but the patient continued to breathe with increasing difficulty till about midnight, when she died.

### *Dissection.*

On examining the body, no air was discovered in the cavity of the chest. The right lung was partially inflated, and the anterior part of it closely adhering to the pleura costalis, as far as the place where the opening had been made. About three pints of bloody fluid lay in the hollow of the ribs posteriorly, and about half filled the cavity of the chest on that side; the surface of it being nearly on a level with the opening which had been made to exhaust the air. Upon the surface of this fluid, the half-in-

flated lung seemed to float.—I looked for the place where the lung had been wounded by the injury, but cannot say that I could perceive it. It was, however, certainly healed; for the lung bore inflation without letting the air escape from it. The pleura was covered with coagulated lymph. The cells of the lung contained a quantity of fluid, and the whole substance of it was of a livid colour.—The cells of the lung of the opposite side of the chest also contained more than their ordinary quantity of fluid; its vessels were turgid, and it was hard and thickened in several places; which was probably owing to former disease. There was likewise more than a usual quantity of turbid serum in the left cavity of the thorax.

It seems to me highly probable, that there are two states of the lungs in emphysema, one of which, indeed, can rarely be proved by examination, since the patients in general do well. I have, however, met with instances in which patients affected with emphysema from a wounded lung, died of other injury, and thus been able to ascertain that the lung had not collapsed. I once also met with a proof of this fact in a patient who survived, and I will relate the circumstances of the case.

CASE.

Mr. Crowther requested me to see a poor man who was brought into a workhouse with fractured ribs, accompanied with a great degree of emphysema. The integuments covering the upper part of the left side of the thorax and neck, were elevated to a great degree by air that seemed confined in one cavity, and not diffused in the interstices of the cellular substance. The integuments of the face were also considerably inflated. The pulse was very fre-

quent and small, and respiration quick and difficult. The extremities were cold. All these circumstances had taken place so rapidly, and were apparently increasing with so much celerity, that I thought it right, for reasons which will be mentioned afterwards, to make an opening into the cavity of the thorax, which I accordingly did, between the seventh and eighth ribs, where the digitations of the serratus anticus muscle meet those of the external oblique. The external wound was made in the manner described in the foregoing case. The lung was in contact with the sides of the chest, nor did it recede when exposed. Should such an occurrence ever take place, a surgeon has the means of preventing its happening to any injurious degree, by instantly closing the wound. We next made a puncture through the distended integuments on the front of the chest, about opposite to the collar bone. A blast of air escaped, and they subsided to their original level. The diffused air was expressed in some degree from the integuments of the face and neck through the same wound. A bandage was now applied round the walls of the chest, so as to prevent their motion and the escape of air into the cellular substance, and the patient was afterwards bled. No more emphysema occurred, and the patient did as well as in a case where the ribs are merely broken, and the lungs uninjured. I cannot satisfactorily account for the great quickness and difficulty of respiration that took place in this case, except by attributing it to the agitation of the patient's mind, alarmed by the inflation of his neck and face.

I have seen so many cases of emphysema, attended with very little difficulty of breathing or other inconvenience indeed, proceeding in a manner so like cases of fractured ribs unaccompanied with wounds of the lungs, that I cannot suppose patients were in these cases reduced to the necessity of breathing with one lung only. These patients indeed were all treated in the manner recommended and practised by Sir William Blizard. Observing the great pain and irritation which the constant motion of the fractured ribs occasioned, he was induced to disregard the emphysema, and to confine the motion of the ribs by a tight bandage, in the same manner as when the lungs are uninjured: afterwards the patients were largely bled, and other evacuations were freely made. This practice he has since continued with general success. The pressure of the bandage in general prevents the air from escaping out of the wounded lung, and pervading the cellular substance. It will, perhaps, appear probable to many surgeons, that, for this very reason, the air will be likely to insinuate itself between the two pleuræ, and thus occasion a collapse of the lung. I do not, however, see any good reason for such a supposition. The two pleuræ remain in their natural state of contact; and there is no space for the air to pass between them. So frequently also are there adhesions between the surface of the lung and the sides of the thorax, that I think, in some of the cases of emphysema which I have seen, this circumstance must have occurred, and that if the lungs had receded from the sides of the thorax, the symptoms would have indicated the laceration or stretching of these adhesions.

An idea has generally prevailed among surgeons, that if the pleura costalis were divided in the living subject, the lung would immediately collapse, as it

is usually found to do in the dead one. But M. Bremond* has shown by experiments, that not only when an opening is made into the cavity of the thorax, but even when some of the ribs are removed, the lungs still occupy their natural situation, and are even thrust up into the opening during expiration. Mr. Norris has also lately shown, by experiments undertaken for this purpose, as well as by observations on the effects of accidents, that frequently the lungs do not collapse when the cavity of the chest is exposed in the living animal;† and I have also had occasion to observe, on dividing the pleura costalis in a case of supposed hydrothorax (in which, however, no water was found), that the exposed lung did not collapse; a circumstance which, I think, ought to encourage us to a more frequent performance of such an operation. In other experiments, however, the lungs have been known to collapse; and the circumstances, on which either of these effects depends, are not perhaps well understood.

For these reasons, I believe, that in most cases of emphysema succeeding to broken ribs, pressure by bandage not only hinders the air from diffusing itself through the cellular substance, but serves to prevent it from escaping out of the wounded lung, and of course facilitates the healing of the wound, which would be prevented by the constant transmission of air. Its early application, therefore, will often prevent a very troublesome symptom, whilst, at the same time, by keeping the fractured bones from motion, it greatly lessens the sufferings of the patient.

In some cases where the lungs are wounded by the ribs, the air does undoubtedly get into the cavity of the thorax, as happened in the case of the poor

* Memoires de l'Acad. des Sciences, 1739.

† Memoirs of the Medical Society of London, vol. iv. p. 449.

woman already mentioned, and as I have seen in other instances. When the air passes from the wounded lung into the cavity of the chest, and the lung becomes in consequence collapsed, still the symptoms and progress of the complaint will differ from the effect of circumstances which have not been much attended to. When the wound in the sides of the thorax allows of the expulsion of air from that cavity during expiration, and does not admit air during inspiration, it is not to be supposed that the wound of the lung can heal; for the cavity of the thorax must, under these circumstances, be filled from the wounded lung every time that it is enlarged during inspiration.

But this state of circumstances, which is so particularly injurious, and which usually takes place when the lung has collapsed in the manner described, it is the business of the surgeon to remedy: and it may be accomplished in two ways; First, by preventing the escape of the air from the cavity of the chest, in which case the necessity of its being filled from the wounded lung will, in a great measure, be done away. And as I know surgeons have apprehended, that if an outlet was not given to air from the cavity of the chest, the opposite lung might become oppressed, I beg them to reflect a little on the state of respiration under these circumstances.

To examine this subject, let us suppose the thorax expanded, and one of its cavities filled with air, at which time the patient attempts to make an expiration; what will be the effect? The air cannot return through the wound in the lungs; and we have supposed that it cannot escape through that in the pleura costalis. The muscles of respiration are unable then to produce any considerable change in the dimensions of the cavity, without an exertion productive of pain, which it is not probable that they

will make; the inactive diaphragm will not be thrust up into the hypochondrium as in natural expiration, and the ribs will remain nearly stationary; but in proportion to the degree of the expiratory effort that is made, the air may be condensed, and the mediastinum thrust to the opposite side of the chest. But no injury will arise from this pressure, neither can it happen in any great degree; for both sides of the chest being diminished at the same time, a slight compression of the opposite lung cannot be detrimental, since it helps to express the air from it, —the very effect which is now required; and as that lung is pressed inwards by the sides of the throax, it will counteract any great pressure made on the mediastinum. Upon inspiration taking place, the condensed air will expand and fill the enlarged cavity, and the mediastinum will regain its natural situation; so that the function of the sound lung is scarcely, if at all, impeded by the compression which takes place on the opposite side of the chest.

In whatever state the lungs happen to be when they are wounded, a bandage, if it can be borne, seems therefore to me extremely useful. By means of it, the pain and irritation, which the motion of the fractured ribs must otherwise occasion, are, in a great measure, or entirely, prevented. In that state of the lungs which I have first described, the pressure of a bandage prevents emphysema, and does no harm; in the other, it not only prevents emphysema, but does good, by keeping the collapsed lung at rest, and thereby free from the necessity of constantly transmitting air. Patients, however, will not always be able to wear a bandage when one lung is collapsed (particularly if any previous disease has existed in the other) as it equally confines the motion of the ribs on both sides, and as every possible enlargement of the chest becomes necessary for the

due admission of air into the lung which still executes its functions. Under these circumstances, if the emphysema continues (and its continuance must always denote that the wound in the lung is not closed), I should esteem it the best practice to make a small opening into the chest, so that the external air might have free communication with that cavity; and then the injured lung must remain motionless till its wound is healed, and the mediastinum will, in every state of the thorax, preserve its natural situation.

As almost all the circulating blood must, in such cases, be transmitted through the vessels of one lung, if the quantity of that fluid be not greatly diminished, the pulmonary vessels will become turgid; a larger effusion of fluids will therefore take place into the air-cells and cavity of the chest, and thus the function of the acting lung will be materially impaired. This reasoning illustrates what experience has already determined, viz. that the preservation of life in these cases depends on the most copious blood-letting.

The case, which I have related, clearly shows, that the collapsed state of the lung affords an opportunity for the wounds of its surface to heal; and when this desirable event is accomplished, the air which is at that time in the cavity of the thorax, will be speedily absorbed, and the lung will again acquire its former size and situation. But should the function of it be more immediately necessary, from a diseased state of that on the opposite side, or from other circumstances, it may be more quickly restored by exhausting the air, in the manner described. If the cavity of the chest contain a quantity of fluids, and it is thought right to extract them, it cannot well be done by varying the posture of the patient so as to let them run out of the opening

that has been made: the difficulty with which respiration is performed, will render such an attempt almost insupportable to the patient. It would therefore be better to introduce a hollow bougie, or some such instrument, into the posterior part of the thorax, there connect it to the syringe, and thus extract the contained fluids. I need scarcely add, that the same method may be employed with advantage for the extraction of water from the cavity of the chest in hydrothorax.

The great advantage of retaining the lung in a collapsed state is, if possible, more strikingly shown when those bodies have suffered a greater degree of injury than can occur to them from the fracture of a rib. I have seen cases in which bullets have passed through the lungs, near the root of those bodies, and where many of the large vessels were consequently torn, in which the blood has been poured into the cavity of the chest, has condensed the lung by its pressure, and thus suppressed the hemorrhage. The injured vessels might, under these circumstances, unite; and the blood being let out of the thorax, the lung might gradually be restored to its former function. Yet in the cases which I was a witness to, the patients died of inflammation and fever; but the particular nature of the circumstances was unknown during the life of the patient; and of course the conduct appropriated to them was not pursued. The fluid contained in the cavity of the thorax had in these cases undergone a degree of putrefaction previous to the patient's death; which state required its discharge.

But should this be attempted in other cases, it becomes very essential to keep the thorax filled with air, lest the lungs should become prematurely inflated, the newly-healed part lacerated, the hemorrhage renewed, or inflammation induced; and the surgeon

would be able, I believe, without much contrivance, to regulate the inflation of the lungs, as circumstances seemed to indicate. Surgeons used formerly to keep canulæ in the thorax in these cases, with a design to give an outlet to fluids; but such means might have been beneficial by preserving the lungs collapsed; and they might have been continued from being found serviceable, though the manner in which they became so was unknown.

# SURGICAL OBSERVATIONS.

## *On the Operation of Puncturing the Urinary Bladder.*

MR. HOME, to whom the profession is much indebted for many important improvements in practice, has of late published some cases of the puncture of the bladder from the rectum, which, in my opinion, are of the greatest importance. They not only exhibit that operation as more simple and successful than perhaps was generally believed, but if the operation be as successful in the hands of other surgeons, it presents an easy mode of relief to a great number of unfortunate patients, who have generally been left to die in misery. I mean those who have strictures impassable by bougies, and who are so irritable that they cannot bear the application of caustic, on account of the retention of urine which it occasions. In such cases the puncture from the rectum appears most eligible, because the bladder is contracted, is in general irritable, and will not perhaps ascend high enough to admit of being punctured above the pubes.

But there are cases in which the operation by the rectum cannot be performed, and by frequently meeting with these I have been compelled to puncture the bladder above the os pubis, and the event of the operation has been such as would have led me to prefer it to any other that I had seen practised. The chief cases to which I allude are those of enlarged prostates,

where the catheter has been forced into the substance of the gland, and has torn it considerably; consequently that instrument enters so easily into the false passage as to render it almost impossible to make it take the right one. Indeed in cases of stricture, where false passages have been made, and the prostate has been sound, the perception of the bladder from the rectum has been so indistinct that I have been deterred from puncturing it; and in one case I made a division in the perinæum, and having passed my finger beneath the arch of the os pubis a considerable way, I could obtain no such distinct perception of the bladder as would authorize me to push in a trochar. But I punctured it above the os pubis, and drew off a considerable quantity of urine. I have therefore been led to conclude, that in some distended bladders, there is a kind of recession of them from the perinæum, and that when they become distended they ascend proportionally higher into the abdomen.

In the greater number of cases in which I have punctured the bladder above the os pubis, it has been on a sudden call to the hospital, or some poor house; and I have had little further concern with the patient than what related to the performance of the operation.

Sometimes I have been in doubt if there was much urine in the bladder, and this circumstance has deterred me from puncturing, except in that situation in which I could possess an assurance that I felt the bladder, and could puncture that viscus: and these doubts caused me in some instances to puncture the bladder with a lancet; and in some cases I have not left any canula in the bladder, in consequence of the escape of the urine preventing me from readily finding the opening which I had made. Several of the patients died, but in every instance the operation relieved their sufferings; and I have never seen any ef-

fusion of urine into the cellular substance, or any other bad consequence result from the operation; nor do I think that such events are likely to happen, if it be rightly performed. The death of the patients was fairly to be imputed to the delay of the operation, or the degree of disease which previously existed in the urinary organs. In several patients who recovered, the progress of their amendment was similar to that which took place in the case, which I am about to relate. I did not, however, preserve any detailed account of them, for, as I have mentioned, the patients could scarcely be said to be under my care. I have requested the last gentleman, with whom I attended a patient under these circumstances, to give me a particular account of his case, and on the accuracy of his narrative I can place perfect reliance. This case I shall relate, in order to have an opportunity of commenting on the mode of puncturing the bladder above the os pubis.

CASE.

A gentleman, between sixty and seventy years of age, had a retention of urine from an enlarged prostate gland, which obliged his surgeon to draw off the urine night and morning. This was done during ten days, when the difficulty of introducing the catheter, which had gradually increased, became insurmountable. I was therefore obliged to puncture the bladder, and the only place in which this operation could in the present instance be performed, was above the pubes. I therefore made an incision about two inches in length through the integuments, and between the musculi pyramidales abdominis, so that the lower part of the wound laid bare the top of the symphysis pubis. On introducing my finger into this vacancy I felt the distended bladder. The sensation produced

by pressing against the distended bladder is I think so peculiar, and so different from any thing else which could occur in this situation, that if an operator has once felt it, he will not hesitate in deciding that it is the bladder against which he presses. The thickness and tension of its coats, and its fluid contents are the chief circumstances from which this peculiar feel seems to arise. When I first began to perform this operation, I was deterred from using a trochar by a fear of being misled by my sensations. I cautiously punctured the bladder with a lancet, designing to introduce a catheter through the wound; but the urine gushed out so violently, and the bladder became contracted so suddenly, that I could not discover the wound which I had made; yet under these circumstances, the urine passed from the aperture in the bladder, through the external wound, and was not diffused into the cellular substance. Indeed neither observation nor reasoning would induce me to suppose that such an occurrence is probable, whilst there is a free external opening. The apprehension seems to have arisen from the extensive diffusion of urine, in cases where the urethra has given way. But in such cases, the urine is actually injected into the cellular substance, and with great force, by the bladder, in consequence of the channel out of the body being closed up. If the external wound in this operation were to be closed, and the exit of urine prevented by this means, then it is probable that the urine would be forced to pervade the cellular substance. It may be asked, if urine is in any way likely, according to the common phrase, to insinuate itself into the surrounding cellular substance? I should think not. The operator should be cautious not to make any separation of the bladder from the back part of the symphysis pubis, that there should not be even a cavity into which the urine might gravitate. He

should also leave the external wound free and open. The first effect of the operation will be an inflammation, which will consolidate the surrounding cellular substance, and prevent the ready impulsion of urine into it. The stimulating qualities of the urine will augment this inflammation, and thereby increase the effect. Indeed the stimulus of the urine often occasions a sloughing of the surface of the wound, which however makes no alteration in the general circumstances of the case. In later operations I acquired more confidence, and a belief that I could distinguish the bladder from any thing else by its feel; and one case which occurred tended further to embolden me in the performance of it. Being called on a sudden to relieve a patient, who had had his urethra lacerated, and being urged to puncture the bladder by several gentlemen who were present, and who were certain that a considerable quantity of urine was detained: though I could not feel the bladder distended above the pubes, I consented, as the patient was in imminent danger, to perform the operation, and having punctured the bladder with a trochar, four, or five ounces only of urine were discharged. However a large quantity of urine gradually flowed through a canula which was introduced. The patient died, and was examined, when the cause of this occurrence became apparent. A large cyst made by the protrusion of the internal coat of the bladder, had been formed between the bladder and the rectum, which contained the greatest quantity of the retained urine. The orifice, by which this cyst communicated with the bladder, did not exceed in dimensions the barrel of a common quill. It also appeared that, though the bladder itself could not in this case be said to have been distended, yet the front of it only was wounded by the trochar, and the back part was uninjured.

To return from this digression to the operation in

the case which I was relating: after I had, by an incision between the pyramidales muscles, enabled myself to pass my finger along the upper part of the symphysis pubis, so as to press against the distended bladder, I introduced a common trochar of the middle size, in a direction obliquely downwards. There is an advantage, as Sabatier, in his Medicine Operatoire, observes, in introducing an instrument in this direction, for it accords with the axis of the bladder, and is therefore not likely to injure the opposite side of that organ. When I found that the instrument had penetrated the cavity, I withdrew the stilet within the canula, and then pushed the canula obliquely downwards, so that about two inches of it were introduced into the bladder. On withdrawing the stilet of the trochar, the urine gushed out with great force, but I prevented its escape, by placing the thumb of my left hand against the mouth of the canula, and then introduced through it in the same oblique direction, a middle sized hollow elastic catheter, till it met with resistance by touching the bottom of the bladder. After the urine was discharged, the canula of the trochar was withdrawn over the elastic catheter, which was left in its situation, and the end which came out of the wound was bent downwards towards the pubes, and attached, so as to be kept motionless, to a circular bandage put round the body of the patient. The wound, which was funnel-shaped, being wide externally, and gradually contracting to the bladder, was covered with linen, spread over with spermaceti salve. The urine flowed not only through the catheter, but by the sides of it. A slight inflammation occurred round the wound, such as would doubtless tend to consolidate the surrounding cellular substance. The surface of the wound in this case did not even slough, at least in any evident degree. Four days after the operation the patient got up, and walk-

ed about his chamber, and feeling himself comfortable and well, he did not go to bed again till night. At the end of a week some few drops of urine came through the urethra, and the quantity thus discharged daily increased. At this time as the catheter seemed to be clogged up with mucus, it was withdrawn, and another was introduced with perfect facility. In about three weeks, as the urine came pretty freely through the urethra, the catheter was withdrawn, and the patient voided his urine by the natural channel. In six weeks the external wound was perfectly healed, and the patient was as well as before the retention of urine took place.

Since the publication of the preceding case, I have many times performed the same operation, and without observing any thing contradictory to the statement which I have given. I shall briefly relate the particulars of one of the cases.

CASE.

A gentleman, who came from the country, was seized with retention of urine, and the medical man to whom he first applied for relief was unable to draw off that fluid. Before I made any attempt, I first introduced a bougie, which I think, ought in all cases to be done, in order to examine the state of the parts prior to the introduction of more rigid and injurious instruments. It passed into the prostate, but could not be made to proceed further. A small sized catheter much curved, or bent upwards towards the point, was next introduced, which entering the bladder, the urine discharged. Upon attempting to withdraw the catheter, I found that I could not do it without employing considerable force, so firmly was it compressed by the neck of the bladder. I examined the prostate per anum, and did not find that gland materially

enlarged, so that I conclude the difficulty of introducing and withdrawing the instrument arose from an enlargement of what Mr. Hunter called the valvular part of the prostate, and Mr. Home describes as its third lobe. Being fully aware of the improbability of my being able to introduce a catheter night and morning to draw off the urine, in this case, I employed for that purpose, at my next visit, a flexible varnished catheter, and left it in the bladder. This gave pain to the patient, and did not long remain in the cavity of the bladder; I was therefore under the necessity of attempting to draw off the urine twice a day with the common catheter. I succeeded in doing this for several days, each time encountering a difficulty in introducing the instrument, which was surmounted by keeping the point of the instrument closely in contact with the upper part of the canal; and I continued to experience considerable difficulty in withdrawing the instrument after the escape of the urine. One morning, however, I was unable to accomplish the introduction of the catheter, and felt myself obliged to puncture the distended bladder. The operation was performed as in the preceding case. A month elapsed before the patient voided any urine by the natural channel. The quantity of that fluid which was discharged through the urethra when he wanted to make water was at first small, and gradually increased in another fortnight to about four ounces. After this evacuation, the plug being removed from the tube inserted at the pubes, six or eight ounces of urine were discharged from it; it therefore appeared, that the bladder had but very partially regained its power of expelling the urine. When this operation is performed, we can know with some degree of accuracy when the bladder has fully regained its powers; and, consequently, when we ought to remove the tube. The patient was very anxious to return into the coun-

try, and I knowing the great impediment that existed to the expulsion of the urine in his case, dared not to remove the tube; nor has it appeared proper to do it since that time. He has now kept the tube in his bladder, I believe, more than two years. He has lately complained much of the badness of the varnish with which the tubes are covered; and it is greatly to be regretted, that in this country, no one has the art, or takes the trouble, of varnishing these catheters as they are done in France.

## ON THE TIC DOULOUREUX.

As the public attention has been of late excited to that painful affection of the nerves, called Tic Douloureux, I shall in the next place relate a case of that disease, which lately came under my care, because it seems to me to elucidate the nature of the disorder, to demonstrate the degree and kind of advantage which is likely to result from the division of the trunk of the nerve, and also to illustrate some circumstances in the anatomy and physiology of the nervous system, of which I have not as yet met with any satisfactory explanation.

### CASE.

A lady became gradually affected with a painful state of the integuments under and adjoining to the inner edge of the nail of the ring finger of the left hand. No injury to the part was remembered which could have brought on this disease. The pain occurred at irregular intervals, and was extremely severe during the time of its continuance, which was for a day or two, when it usually abated. Accidental slight injuries always occasioned great pain, and frequently brought on those paroxysms, which however occasionally occurred spontaneously, or without any evident exciting cause. In all these particulars the disease correctly resembled the Tic Douloureux of the nerves of the face. As the pain increased, the disorder seemed to extend up the nerves of the arm. After the patient had endured this painful affection for seven years, she submitted to have the skin, which was the original seat of the disorder, burned with caustic. This application gave her intense pain, and

on the healing of the wound she found her sufferings rather augmented than diminished by this experiment. After four more years of suffering she consulted me, when the circumstances of the case were such as to render an operation indispensably necessary. The pain of the part was intolerable, and it extended all up the nerves of the arm; and this general pain was so constant during the night, as to deprive the patient of rest. The muscles of the back of the neck were occasionally affected with spasms. The integuments of the affected arm were much hotter than those of the opposite side, and sometimes the temperature was so increased as to cause a burning sensation in them. Under these circumstances, I did not hesitate to divide the nerve of the finger, from which all this disorder seemed to originate. I laid it bare by a longitudinal incision of about three quarters of an inch in length, from the second joint of the finger, and divided it opposite to that joint, by a curved sharp pointed bistoury which was conveyed under it. I then took hold of the nerve with a pair of forceps, and reflecting it downwards, I removed a portion of it half an inch in length, that the possibility of a quick reunion might be prevented. The wound was brought together by sticking plaster, and it united by adhesion: but the upper part of the wound, opposite to the upper end of the nerve, became slightly inflamed, and was very painful; however the appearance of inflammation gradually went off in the course of three weeks. After the operation I pinched the originally affected integuments sharply with my nails, without causing any sensation; but if in so doing I moved the finger, then pain was felt. I found it difficult to convince the patient that the skin at that part was actually devoid of sensation, for she still continued to feel similar sensations to those which formerly occurred, though in a much di-

minished degree: but she became gradually as perfectly convinced as any medical man could be, that these sensations arose from the irritated state of the end of the nerve, above the place where it was divided. The painful affection of the nerves of the arm still continued, though considerably lessened in violence; however, it was sufficiently severe to make the patient apprehend that little permanent benefit would arise from the operation. This pain continued occasionally about four months, with varying degrees of severity, but the temperature of the skin was not hotter than that of the opposite side, as it had been before the operation. At the expiration of three months, the patient ascertained that the integuments at the end of the finger actually felt when any thing was applied to them, and this proved a new source of alarm. More than nine months have now elapsed since the performance of the operation, and the general pains in the nerves have become very trivial; but the sensation of the integuments at the end of the finger has during that time gradually increased, and the skin has now its natural sensibility, so as accurately to distinguish the tangible properties of any body applied to it. If also the originally affected part be compressed slightly, painful sensations resembling those which formerly occurred take place.

The observations of Dr. Darwin relative to ocular Spectra, and the experiments of Mr. Home on the contraction of divided nerves (contained in the Croonian Lecture, inserted in the Philosophical Transactions for the year 1801) have given a kind of demonstration that there is a subtile and mobile matter superadded to the visible fabric of nerves, and sanction the use of the yet novel terms of the irritability and irritable actions of nerves, and I shall therefore employ them in the few subsequent remarks which I have to offer.

The case above related appeared to me to merit publication, because I believe it is not a common occurrence for the tic douloureux to happen any where but in the face. In the instances related by Mr. Home in his Croonian lecture, the disease was the effect of an injury done to the thumb; and it is reasonable to suppose that it would not have taken place without a predisposition to it in the constitution of the patients. It is also not unfair to conclude that the disease thus occasioned was of a more general nature, and less confined to the extreme branches of the nerves, and therefore less susceptible of cure by an operation. The case, which I have related shows, as indeed might have been concluded à priori, that though the source of the irritable state of the nerves in the tic douloureux may be cut off by an operation, yet that the general irritable actions of those organs, which had been excited, and had continued for a long time, would not immediately cease, though they might, as happened in this instance, gradually subside.

The speedy return of sensation, which is both accurate and acute in the present case, must surely be deemed a curious circumstance. It cannot be attributed to a reunion of the divided nerve, since so large a portion of it was removed; for I believe in simple divisions of the nerves by accident, sensation is slow in returning. It must, I think, be admitted, that sensation in the present instance took place through the medium of the communicating branches of those organs, and probably its speedy renovation was the effect of their unusually active or irritable state.

Nerves strikingly resemble arteries in their modes of communication; sometimes they conjoin even by considerable branches, such as must be manifest, in common dissections; but they communicate in surprising numbers by their minute ramifications.

This circumstance is not perhaps so familiarly known to professional men, since it cannot be perceived unless in the course of a very minute dissection, and to understand how numerous these communications are, the representations given by the German authors, of their delicate and laborious dissections, may be advantageously consulted.*

The communications of nerves seem also not to have excited much attention amongst physiologists; at least I have not met with any probable conjecture concerning their use. I shall therefore take the liberty of mentioning as briefly as possible, what has occurred to me on that subject.

The opinions of Mr. Hunter respecting a subtile matter inhering in the brain and nerves, and diffused throughout the body, are, I believe, generally admitted, though variously expressed. Now if the brain and nerves be supposed in those animals who possess them, to be the chief if not the sole organs for the preparation of this subtile matter, then it appears as necessary that the nerves should communicate, as that the arteries should do so. For if the continuity of the trunk of either of these organs were destroyed, the parts, which its branches supply, would perish were it not for their communication with the minute branches of other adjacent trunks. It is probable that one of the advantages derived from important organs being supplied from plexuses of nerves is, as has been suggested by Soëmmering, that such essential organs should never want that animation and influence, which they derive from the nerves, even should casual obstruction take place in some of the trunks leading to such a plexus. But parts less essential to

* See Meckel's Representation of the Nerves of the Face, or Frotscher's of the Cervical Nerves, in Ludwig's Opera Minora, or Walther's Plates.

life, equally require that such interruption of the nervous energy should be guarded against. Have we not a plexus formed in the axilla, prior to the distribution of nerves, to the upper extremities? do not the sacral nerves form a plexus, in order to form the ischiadic or posterior crural nerve? and may not the same circumstance be affirmed with respect to the anterior crural, and obturator nerves, since they arise from the complicated union of the lumbar nerves, with a branch of the first sacral nerve? The reticular communications of the minute nerves may not only serve the purpose which has been suggested, but, as appears from the present case, the actions which take place in the extremities of the nerves may, by them, be propagated to the sensorium, and thus produce sensation. Whether, in the present instance, the original painful actions of the extremities of the nerves may again recur, and be continued throughout the communicating branches to the sensorium, the future progress of the case will determine.

The lady, whose case I have related, died about four years after the operation, of disorder of the digestive organs, to which she was habitually subject. Indeed, from what I have since seen of cases of Tic Douloureux, I am induced to believe, that this disorder is as much constitutional as either gout or rheumatism. I have known patients afflicted with it get well, either spontaneously, or in consequence of the administration of medicines which were likely to relieve or counteract nervous irritability.

## ON THE REMOVAL OF LOOSE SUBSTANCES FROM THE KNEE JOINT.

I shall next relate a case in which some of those loose substances that are frequently found in the knee-joint were removed by an operation; because I think the case contains many interesting particulars, and because it will afford me an opportunity of offering a few observations on the necessity and mode of performing such an operation. Mr. Hey has of late recommended a bandage to keep these bodies stationary, and has related several instances of its efficacy, and of course of its preventing the necessity of undertaking a serious and uncertain operation. When loose substances exist in the knee-joint, and are lodged on either side of the patella, they produce but little inconvenience; but when they slip under the ligament of the patella, and become interposed between the condyles of the os femoris and the tibia, they impede progression, and cause pain, and so much injury as to bring on inflammation in the joint. If the extensor tendons, the patella and its ligament, can, by Mr. Hey's bandage, be kept steadily pressed against the corresponding parts of the joint, then these bodies must remain stationary on one or other side of the patella, and the patient will be exempted from the inconvenience and injury which their motion in the joint occasions. Under these circumstances the necessity for an operation is obviated; but in the case which I am about to relate the bandage was of no avail, for reasons which will appear in the relation. It is not improbable also that though these bodies may occasion much irritation at first, yet that the joint becoming accustomed to their sti-

mulus may afterwards be less affected by their presence, which circumstance ought to be adverted to and ascertained before an operation be undertaken.

CASE.

A man, about forty years of age, having fallen from a ladder, and injured his knee, suffered afterwards a good deal from inflammation in the joint. The joint became much better, but never perfectly recovered; and after a year had elapsed he slipped in walking, and again injured his knee. From this time he became sensible of the presence of two movable bodies in the joint, which incommoded him considerably. They frequently, in walking, got between the condyles of the os femoris, and the crucial ligaments, giving him great pain at the time, and produced heat and inflammation of the knee afterwards. He bore this inconvenience for several years, till at length, coming to London, he resolved to submit to the operation for their removal if it were recommended. When I saw him there was a considerable quantity of synovia in the joint, the knee was hotter than that of the opposite limb, and in this state he said it usually was. There was no difficulty in bringing the two loose substances to the inner side of the joint; and it required only to put that part in a depending position, and those bodies descended by their gravity through the fluid, and were easily fixed in the situation to which they had fallen. I could bring them on the inner surface of the internal condyle of the os femoris, which is of considerable extent, and by placing the points of my finger so as to describe a portion of a circle, I could prevent them from passing again into the cavity of the joint although the limb might be moved, and the patient press firmly against them with his finger, as if he meant to push

them into the joint. Yet when my fingers, which thus confined them were removed, the slightest touch caused them to disappear, and to glide with velocity into the general cavity of the joint.

This is the situation, and the manner in which I think these bodies can be most conveniently and certainly fixed. The inner surface of the internal condyle of the os femoris presents an extensive and nearly plain surface, which terminates in front and at its upper part by an edge which forms a portion of a circle. If the points of the finger be firmly pressed upon this edge so as to form a kind of line of circumvallation round these bodies, they cannot pass into the joint in this direction, nor can they recede in any other, on account of the tense state of the internal lateral ligament. Here these substances are near the surface, and may be distinctly felt; and there is nothing to be divided in order to expose them, but the integuments, fascia, and the capsule of the joint. Mr. Cruikshank says, that Mr. Hunter preferred removing these loose bodies at the upper part of the joint, as there, the bag which contains the synovia has less of the nature of the capsule. Mr. Ford, in a case which required the operation (and which is related in the Medical Observations and Inquiries,) extracted the substance on the outer edge of the patella; and if the substance is large, it may undoubtedly be extracted in this situation. In the case, which I am going to relate, it would have been impossible to fix the loose substances in any other situation than that which I have described, and in my opinion that situation must in most cases be preferable to any other, for the reasons which I have mentioned.

I did not hesitate to undertake the removal of the bodies in the present case, as they could be so securely fixed. For the patient had tried bandages without any advantage, which perhaps was owing to the

quantity of fluid in the joint preventing them from acting in the manner mentioned above. His sufferings were very considerable, and the necessary restriction in exercise extremely inconvenient. I thought it right to reduce the inflammation of the joint as much as possible, prior to the operation, and with this view directed the application of leeches, and of linen kept constantly damp with Goulard's wash: some aperient medicine was also given. By these means, in the course of three days, all the fluid was removed from the joint, and it was as cool, and free from pain and inflammation as the other knee; but when I endeavoured to get these bodies into the situations in which I had formerly fixed them, I found all my efforts were in vain. There was no fluid for them to descend through, and though one of them could be got into the situation which we wished, we could not, after trying nearly an hour and an half, succeed in getting both of them upon the condyle of the os femoris. I was therefore obliged to let the patient walk about a little, that some more fluid might be effused into the joint, and then I could bring them both into the same situation, and fix them as readily as before.

The operation was done in the following manner. Sir Charles Blicke, who assisted me, pressed the integuments of the knee gently towards the internal condyle, and then applied his finger in the manner I have described, round the circular edge of the bone. I also drew the integuments gently towards the inner ham-string, and divided them longitudinally, immediately over the loose substance, to the extent of an inch and an half. This withdrawing of the integuments from their natural situation was designed to prevent a direct correspondence in the situation of the external wound, and that of the capsule of the joint; for when the integuments were suffered to regain their natural position, the wound in them was nearer to the patella.

than the wound which was made in the capsule. The fascia which covers the joint being exposed by the division of the integuments, it was divided in a similar direction, and nearly to the same extent. The capsule was now laid bare, and I gently divided it to the extent of half an inch, where it covered one of the hard substances, which suddenly slipped through the opening, and by pressing gently upon the other, it also came through at the same part. The bodies, which were thus removed, were about three quarters of an inch in length, and half an inch in breadth. They had a highly polished surface, and were hard like cartilage. The fluid contained in the joint was pressed towards the wound, and about two ounces of synovia were discharged. I then drew the wound of the integument gently towards the patella, pressed the two sides together, and closed it accurately with sticking plaster, enjoining the patient to keep the limb as free from motion as possible.

No inflammation took place in the knee, either on that day, or the following; but on the second night after the operation the patient suffered a good deal of pain, and in the morning the joint felt hot, and was distended with fluid as it had been before the operation. I now removed the dressings, and found the wound was closed; but I felt very apprehensive lest, the inflammation of the joint continuing, the collection of fluid should also increase, and by distending the capsule, cause the wound to open. Having already seen in this case the beneficial effects of evaporating washes, which by diminishing the heat of a part check its tendency to inflammation, I was desirous of reapplying them. In order to prevent these applications from loosening the sticking-plaster, and causing the exposure of the wound, I made use of an expedient, which I have frequently employed, and which from its utility I think deserves to be mention-

ed. After having supported the sides of the wound in their situation by adhesive plasters as at first, I put over them a piece of linen, which extended beyond them in every direction. This linen was made to adhere to the surrounding skin, by smearing over the edge with a solution of sealing-wax in alcohol, and afterwards varnishing the linen over with the same solution. The alcohol having evaporated, and the sealing-wax remaining, no liquid could penetrate and detach the sticking-plaster. This is the same varnish with which some parts of electrical machines are coated, and its power of remaining unaffected by moisture and moderate warmth is well known.

Folded linen kept damp with laudanum and water was now applied, in the proportion of an ounce of the former to a quart of the latter. This wash I prefer, for the purpose above mentioned, to Goulard's wash; for the precipitated powder contained in the latter is apt to fill the interstices of the linen, and prevent its imbibing the wash, so that the requisite evaporation does not go on. These applications quickly diminished the heat of the knee, and the quantity of fluid contained in the joint speedily decreased. The wound was daily dressed, and in a week was firmly healed; and in a fortnight the patient might be said to be well. He has since the operation walked as much as he was accustomed to do, and has not found the least inconvenience.

I have since the publication of the preceding case, seen one of the same kind, so curious on account of the number of loose bodies contained in the capsule of the knee-joint, that it seems to deserve being mentioned. I do not exaggerate, when I say, they must much exceed a hundred in number, and feel like shot of various sizes, distending the capsule on either side of the patella. There is no fluid in the joint, nor do they prevent the patient from taking ordinary exercise.

## ON THE TREATMENT OF ONE SPECIES OF THE *NÆVI MATERNI.*

I SHALL relate two cases, and say a few words on the treatment of this complaint, which is a congenital deformity, consisting of a cluster of enlarged vessels, filled, and occasionally distended by the influx of blood from numerous surrounding arteries. The deformity to which I allude is so well known, and so frequent an occurrence, as to preclude the necessity of any description. Mr. John Bell has of late proposed an ingenious theory of its formation, and has denominated it an aneurismal enlargement of the vessels, in consequence of their anastomoses. There can be no doubt that the repletion, distention, and consequent enlargement of the dilated vessels depend upon a kind of inflammatory action of the surrounding arteries; for, if that be wanting, the mark ceases to enlarge, and if present, it increases in size in proportion to the degree of inflammatory action. In many cases these marks having increased to a certain degree, cease to enlarge; they then remain stationary, or gradually diminish, till they almost disappear. This occurrence is not so frequent as to induce surgeons to expect such an event, or to prohibit, in consequence of such expectation their removal. For, if they continue to enlarge, the operation must be commensurate to their size. The consequences of their bursting are alarming and vexatious. It is not, however, my intention to speak of these affections in general, but only to state what, perhaps, may in some instances be done with success, when the removal of the unnatural structure cannot be accomplished. For

this preternatural enlargement of vessels is not always cutaneous. I have seen it occupying the whole substance of the cheek, neither appearing beneath the skin nor the membrane of the mouth: I have met with it in the orbit of the eye, and have found it covering the whole of an extremity, or nearly one half of the trunk of the body. If any means can be pursued, under such circumstances, to check the progress of the complaint, they surely deserve attention. I was lately so fortunate as to succeed in such endeavours, in cases, the relation of which is my chief object at present.

CASE.

A child about two months old was brought to St. Bartholomew's hospital, with this unnatural enlargement of vessels, distributed every where beneath the fore-arm, from the wrist to the elbow. In a short time it had swollen to that degree, that the circumference of the affected fore-arm was twice the size of the other. The vessels were large and contorted; and to give the reader an idea of their appearance, I may mention that the child's mother affirmed that they resembled the entrails of a pig, with which she had either been frightened or disgusted during her pregnancy. The skin was of a dusky hue, and had not its natural smoothness of surface. The heat of this fore-arm was much greater than that of the corresponding sound one. Pressure forced the blood out of the vessels, and for the time diminished the bulk of the limb, and made it of a paler colour. The child's mother lives at Turnham Green, where Mr. Graham, an ingenious surgeon, who was for a long time a student at St. Bartholomew's hospital, also resides. I requested this gentleman to take charge of the case, and try the effect of the following plan of treatment,

which it seemed to me right to institute. First, I was desirous of ascertaining whether a permanent and equal pressure would not prevent the distention and consequent enlargement of the turgid vessels; secondly, whether reducing the temperature of the limb would not diminish the inflammatory action, upon which their repletion seemed to depend. These two intentions admitted of being readily accomplished. A many-tailed bandage of sticking plaster seemed adequate to effect the first, and wetting the limb with water the latter. These measures were judiciously carried into effect by Mr. Graham; the pressure was first made slightly, and afterwards more forcibly, as the part seemed to bear it without inconvenience. A roller was applied over the plaster, and kept wet, if the limb felt hotter than natural, so as to regulate its temperature. The success of these measures exceeded our most sanguine expectations. The size of the limb gradually diminished, and its temperature became natural. After six months, Mr. Graham removed the bandages, which it was not necessary to continue any longer. The limb was in some degree wasted, from pressure and disuse, but it soon gradually reacquired its natural size. After the bandages had been left off for a month, I saw the child. The skin was pale, and had a slightly shrivelled appearance. The contorted vessels felt like solid chords interposed between it and the fascia of the fore-arm.

CASE.

A child had this unnatural state of the vessels in the orbit of the eye. They gradually increased in magnitude, and extended themselves into the upper eye-lid, so as to keep it permanently closed. The clustered vessels also projected out of the orbit, at the upper part, and made the integuments protrude.

forming a tumour as large as a walnut. Of course, the removal of this disease did not appear practicable. I was consulted on this case by Mr. Hurlock, to whom I related the success of the former experiment. Pressure to any extent was here evidently impossible: but the abstraction of heat, and consequent diminution of inflammatory action might be attempted. I recommended that folded linen, wet with rose water, saturated with alum, should be bound on to the projected part, and kept constantly damp. Under this treatment the disorder as regularly receded as it had before increased. After about three months it had gradually sunk within the orbit, and the child could open its eye. Shortly afterwards all medical treatment was discontinued, and no appearance of this unnatural structure remains.

A third case of a very extensive mark of this description, covering the back and shoulder, got well, as I am informed, by the same treatment. I have not, however, been able to learn the particulars. It appears to me probable, from the foregoing cases, that if the preternatural distention of the vessels could be prevented, the blood would coagulate in them; and thus this unnatural contexture of vessels, being rendered impervious, might become obliterated.

Since the publication of these cases, which is more than four years ago, I have seen many instances of such affections, and they have ceased to grow, and afterwards shrunk, and been no longer objects of any consequence when treated in the manner that I have described. I have only in one case been called upon to perform an operation for the removal of the swelling, which had attained a very considerable magnitude before I was consulted respecting its treatment.

## ON HEMORRHOIDAL DISEASES.

MR. HEY of Leeds, in his highly valuable Observations, describes his mode of treatment of the procidentia ani, and that chapter of his work appears to me to deserve particular praise, because I have not found the same treatment recommended by other writers; and because, from the accounts of the patients themselves, it has relieved them from very great inconvenience and suffering. Wishing to corroborate the statement there given, and to add my mite of observation on the practice that is best adapted for the relief of such diseases, I may mention, in the first place, that my attention to this subject was particularly excited, even during my apprenticeship to surgery, from witnessing the sufferings of those who underwent what I may call the natural cure of piles. When these organized bodies are large and numerous, they impede the expulsion of the fæces, and the straining consequent to this impediment everts the bowel. When, at length, the patient is unable to restore the parts to their natural situation, the piles mortify and drop off, and then the bowel retires, leaving the patient considerably relieved from the difficulty and pain attendant on the expulsion of the fæces. The editor of Mr. Pott's work says, that Mr. Pott was remarkably successful in removing hemorrhoidal excrescences, by ligature;* in some cases such means may doubtless be proper; yet it has appeared to me, that tying hemorrhoidal excrescences is productive of all that temporary distress which is observable in what I have termed their natural cure;

* See sir James Earl's edition of Mr. Pott's Works, vol. iii.

and as there is a general disorder in the functions of the alimentary canal in all such cases, the irritation occasioned by the ligature aggravates this habitual disorder, and produces sometimes very alarming symptoms.

With these facts before me, I was led to examine the structure of those piles which had been removed by a ligature, or which I accidentally met with in the dead subject; and I found them to be merely fleshy substances, possessing no vessels of considerable size, nor such as should deter us from cutting the excrescences away. It is now twenty years since I first began to remove them freely with the knife or scissars, and I have never met with any circumstance to deter me, whilst the relief of suffering, which the operation has afforded to some, and the scarcely to be expected, and complete cure which it has effected in many, has been highly gratifying. Piles have been supposed to be owing to a dilatation of the hemorrhoidal veins, and that these veins are sometimes enlarged, is evident from anatomical examination, and from cases which occasionally occur in practice. In a recent attack of an hemorrhoidal affection, something occasionally protrudes from the anus, which when punctured emits a continued stream of blood, as a vein does when opened. When the blood ceases to flow, the protruding part should be replaced, and maintained in its natural situation.

The origin and formation of internal piles, is, I think, similar to those which are external. When from irritation about the rectum, an external pile forms, a swelling suddenly occurs beneath the thin skin, near the verge of the anus, and the part is heated and painful. If the skin be divided, the swelling is found to be caused by effused blood; and if the clot be removed, there is no stream of blood emitted as from a vein. If the wound be small, blood again col-

lects beneath the skin, and the swelling is reproduced. If the bowels be regulated, so that the state of irritation, which is the cause of these productions, be mitigated or removed, and if the slightly painful and heated swelling be cooled by evaporating washes, the effused blood is frequently absorbed, and the distended skin appears loose and pendulous. On the contrary, if the irritation continues from there being some permanent disease on the inside of the bowel, then the effused blood becomes an organized substance, and a permanent external pile is formed. The orifice of the anus is often surrounded by tumours of this kind, which, however, do not require to be removed, and are only indicative of internal irritation. In like manner blood is effused beneath the bowel just above the sphincter, and forms an internal pile. If it be divided, coagulated blood may be removed from beneath it, with the same events as occur in external piles. The effused blood is sometimes absorbed, and the pile disappears; but, more generally, it becomes an organized substance, and increasing in bulk, whilst others also form, they are productive of those inconveniences that have been represented.

Though the eversion of the bowel may, in many cases, be attributed to the efforts made to overcome the mechanical resistance, which these tumours oppose to the expulsion of the fæces; yet the eversion is not, in general, to be solely attributed to this cause. It arises also from an irritable and striving action of the bowel, which produces a kind of intus-susception. Thus plaits of the bowel often descend in an irritable action of the part during the expulsion of the fæces. I have known many cases of the following description. A person having some disorder of the bowels, and having an urgent call to void the fæces, has suffered afterwards great pain for a number of hours. The next evacuation has been attended with similar

consequences, and thus the patients have continued for a considerable time, ignorant of the cause of their sufferings. On introducing the finger, I have distinctly felt, and fairly replaced a fold of the bowel, and the patient has been immediately relieved from all uneasiness; and by repeating the same act, when required, and keeping the bowels regular by a mixture of castor oil and mucilage, with cinnamon water, they have suffered no uneasiness subsequent to the alvine discharges, and in a short time this faulty action of the bowel has entirely ceased. But if a patient remains ignorant of the cause of his sufferings, and does not adopt this mode of relieving them, the fold of the bowel becomes irritated and thickened by the pressure of the sphincter muscle; it enlarges and becomes in form adapted to this unnatural situation, and thus we often meet with folds of the bowel forming hemorrhoidal tumours. When a pile, or any hemorrhoidal tumour becomes inflamed and swollen, it has a tendency to draw down more of the bowel, and increase the disease.

The eversion of the bowel thus produced from hemorrhoidal affections, must be considered as a different case from that procidentia or prolapsus ani, which takes place independently of such affections, and it is to the treatment of the former only that this paper relates.

In the first volume of these observations, I have mentioned, that to me, all kinds of irritation inducing local diseases in the lower parts of the bowel, appear to be the effects of a general disorder in the functions of the alimentary canal; and that the correction of the general affection is essential to the cure of the local disease. If the bowels can be got to regularly carry down and discharge the residue of the food once in twenty-four hours, the straining, from costiveness, and that irritable and repeated action at-

tendant on purging, both of which must be injurious to the local disease, will cease to aggravate it. The patient should bathe and anoint the protruded parts with ointment, and carefully replace them above the gripe of the sphincter. Under these circumstances hemorrhoidal tumours, and the procidentia ani often become of so little inconvenience, as not to induce a patient to wish for a more radical relief.

But, if from the magnitude or number of these hemorrhoidal tumours, such an opposition should be created to the expulsion of the fæces, that the bowel is forced down at every attempt to discharge them; if from the inflamed and ulcerated state of hemorrhoidal tumours, they keep up an irritable action of the parts tending to maintain and aggravate the disease, then an operation seems to be required.

I shall now describe, in the briefest manner possible, the treatment and mode of operating which I have found most successful in these diseases. First, it seems essential, prior to undertaking any operation, to get the bowels into the habit of regularly evacuating the refuse matter of the food daily, and the liver regularly secreting a due proportion of healthy bile. 2dly, The bowels ought to be perfectly cleared before the operation; and this may be accomplished, by giving to the patient such a dose of medicine as has been found, by experience, to be likely to answer this purpose without inducing a continuance of irritation and purging. The bowel being everted to the utmost by the efforts used in evacuating the fæces, and the parts cleansed by bathing with tepid water, the piles should be taken hold of by a double hook, of a breadth corresponding to the length of the pile, and when drawn upwards from the bowel, it may be removed by a pair of scissars. A protruded and thickened plait of the bowel may be seized in the same way; but I think it is better to use the bistoury in

removing it, because the depth to which the scissars may cut is uncertain. The incision made by the knife resembles two curved lines joined at each extremity. The length of the incision should, both for the removal of piles and that of plaits in the bowel, be longitudinal, in the direction of the bowel.

If, therefore, there be a transverse fold of the bowel of considerable extent, I think it best to take away two elliptical portions in the long axis of the rectum, rather than attempt more completely to remove it by a wound made in another direction.

The hemorrhoidal tumours being removed, the wounds should be suffered to bleed as long as they are disposed to do so, and afterwards the parts should be completely replaced by means of the finger, previously anointed. As irritation is a principal cause of hemorrhage from the small vessels, and as that is likely to be occasioned by any part of the bowel being lodged within the gripe of the sphincter, and compressed by that muscle, this part of the operation should be particularly attended to. The patient should now be speedily placed in an horizontal position, the nates should be exposed, and the parts surrounding the anus should be frequently bathed with cold water, to check inflammation and consequent hemorrhage.

Frequently from the apprehension of the vexation and trouble of a subsequent hemorrhage, the surgeon is desirous, after an operation, of tying every vessel that could possibly pour forth blood; yet after the patient is put to bed, and becomes warm, particularly if there be any circumstance causing local irritation in the wounded parts, hemorrhage even to a considerable degree ensues. The wound is opened and bathed, and often no vessel is discovered bleeding, or requiring a ligature. Diminishing the temperature of parts is one of the most potent means which we possess of lessening inflammatory action, and this seems

to be best accomplished by the continual evaporation which is going on when parts are frequently wetted. Formerly I met with much trouble from hemorrhage, particularly on account of the blood effused into the rectum, creating an uncontrollable propensity to discharge it per anum; and in this act the wounded parts became again protruded and injured. Since, however, I adopted the mode of treatment which I have described, I have witnessed no inconvenience of this kind. In general, the patients feel very comfortable, and the anus seems as if there were no disease. When the parts have been for some time tranquil, and the risk of hemorrhage has ceased, the parts need no longer to be bathed or exposed.

The patient should be restricted in his diet: the food should be of the most nutritive quality, and such as is likely to leave the least residue, but the quantity should be as small as possible, because it is an object to keep the restored parts undisturbed for as long a time as possible. If the opening medicine, which has been given with a view to clear the bowels, before the operation, should be likely to affect them afterwards, some opium may be administered to prevent it.

Under these circumstances I have known patients lie for eight or ten days undisturbed, and during that time the wounds, it is probable, had nearly, if not entirely, healed, as the subsequent discharges from the bowels were effected without hemorrhage, or the descent of any part. However, as these patients have a disordered state of the digestive organs, sensations seemingly requiring some alvine discharges for their relief, will induce us to give some opening medicine long before that period. Experience in the case of our patient should have previously taught us, by what dose of medicine we might calculate, with some degree of certainty, to procure one sufficient and lax motion, which should be parted with by the patient

with as little effort as possible. It is better that the patient should not attempt to evacuate the contents of his bowels till his sensations become urgent. When a sufficient discharge has taken place, if any thing has descended, it ought to be carefully replaced as it was after the operation. A small dose of laudanum may be given to stop any further effect from the purgative medicine. Now, though such operations, conducted on the plan which I have described, have been productive of the beneficial effects which I have represented in the beginning, it is wrong to promise too much to patients in general, because the irritable and disordered state of the digestive organs, which is habitual, and which has produced the disease, may keep up a disordered state of rectum afterwards, and occasion new diseases to form of the same nature.

## ON FISTULÆ IN THE PERINÆUM.

TOWARDS the conclusion of the second part or volume of these observations, when speaking of the effects of diseases of the urethra, I had designed to insert a chapter explanatory of some circumstances relative to those abscesses and diseases, which frequently take place, and lay the foundation for fistulæ in perinæo. In consequence of my being much hurried by business at that time, it was omitted, yet thinking that its publication may be useful, I insert it at the conclusion of the present volume.

It is well known, that abscesses form in the vicinity of the urethra, when it is in an irritable state, but there are some circumstances relative to their progress, which perhaps have not been generally or sufficiently attended to. When matter forms in the course of the membranous part of the urethra, or in the neighbourhood of the bulb, it does not produce inflammation of the skin, or break like a common abscess; on the contrary, the skin is but little affected, and as the matter increases in quantity, it appears kept down as if it were collected beneath a fascia. Under these circumstances it in general comes forwards, in the course of the spongy substance of the urethra, and bulges out in the middle of the scrotum, forming there a tense protuberant swelling. I have sometimes known the matter make its way backwards, and present itself between the thigh and buttock, a little below the rectum. These circumstances indicate, that there is a fascia spread beneath the skin of the perinæum, over the subjacent parts; yet, I think, the limits of this fascia can scarcely be ascertained by dissection.

The knowledge of its existence appears to me of importance in explaining many occurrences which take place about these parts, though its density and strength varying in different persons, the facts which I am endeavouring to represent will vary in degree in different cases.

The abscesses of which I am speaking are often simple, no urine having escaped from the urethra to give rise to them, though sometimes after they have been opened, urine is found to pass through the cavity of the abscess in a greater or less degree.

These abscesses ought of course to be treated as collections of matter beneath fasciæ in general; they should be opened at an early period, to prevent their enlargement. A free opening is proper, because the skin being only slightly diseased, and having a great propensity to heal, will sometimes prevent the free escape of any matter or urine, which may be in the cavity of the abscess. The cavity will then become distended and enlarged, perhaps in a direction between the rectum and the thigh, requiring another opening to be made in that situation: yet, in general, I have not found it necessary to divide the skin throughout the whole front of the abscess.

The complicated sinuses, which form in some cases of fistulæ in perinæo, do not appear to me to arise from such simple cases, but from the urethra ulcerating in many parts. Anatomical examination has shown this to be fact in several cases which I have inspected.

The ulceration, or giving way of the urethra, is, I think, generally understood to be the consequence of a stricture affording so complete an obstacle to the passage of the urine, as to occasion the canal to inflame, ulcerate, or slough above the impediment. It is very evident that this is not unfrequently the case, yet I do not believe that surgeons in general, are

sufficiently impressed with the knowledge of the following fact, that the urethra may ulcerate in various parts from irritation, even whilst there is a sufficient channel for the free exit of the urine. The following cases are related in proof of this fact:

CASE.

A gentleman had been attended for a typhoid fever for between a fortnight and three weeks. A clyster was ordered for him; but the person who was desired to administer it, could not readily introduce the pipe; and, on examination, it was discovered that there was a considerable induration, discolouration, and swelling of one buttock, by the side of the anus. On this account I was desired to see the patient, and the appearance of the part instantly induced me to say, that some urine had escaped from its natural channel, and caused the inflammation which had been productive of these peculiar appearances. The powers of the patient's mind were weak and wandering; yet, when I asked him in a loud voice, whether he had any difficulty in voiding his urine? he replied, "Oh, I told you, it was my first grievance." Yet I saw him void his urine freely, and in a moderate sized stream. Perceiving that there was fluid beneath the thickened and discoloured integuments, I divided them, and discharged a considerable quantity of putrid matter, urine, and sloughs. The patient became, for a time, much better, and urine passed freely through the wound; yet he afterwards gradually sunk, and died. In this case, the urine must have escaped from its natural channel very high up, and have been forced into the cellular substance connecting the bladder and the rectum, producing that peculiar inflammation, which probably occasioned the typhoid fever.

CASE.

A similar occurrence happened to a patient whom I had previously attended on account of strictures in his urethra, and which had been so far relieved, that a moderate sized bougie could be passed into the bladder, and he voided his urine freely in a moderate sized stream. He had for some months discontinued the use of bougies previously to the event which I am going to relate. He was seized with a kind of low fever, but his attention seemed to be directed to the seat of his disease, so that it became remarked at an early period, that the integuments of the buttock, by the side of the rectum were inflamed. The similarity of this case to the preceding one induced me to make an incision through the skin and subjacent substance to some depth, when a considerable quantity of fetid matter and urine gushed out. I saw this patient void his urine, which he did with apparent freedom, and in such a stream as I have described. He was relieved by having an outlet given to the urine and matter, which continued to pass freely through the wound; yet he afterwards gradually sunk, and died. To my great regret, I was prevented from examining the parts after death, in both of these cases.

CASE.

A patient who had suffered for more than a fortnight with slow fever, in which his intellects were so impaired, that he communicated no information to his medical attendant respecting the nature of his disorder, was observed to have a swelling near his left groin, which was supposed to be a common abscess. This disease increasing, and showing no tendency to break, after a few days, I was desired to see the patient. The swelling then was as large as an orange,

but oblong, extending from the groin down the front of the scrotum. The colour and induration of the skin, in such cases, are in general so peculiar, as at once to impress the opinion, that effused urine has been the cause of the inflammation and abscess. I without hesitation cut through the thickened integuments, and discharged about six ounces of putrid pus and urine. A quantity of sloughy cellular substance soon afterwards protruded through the wound, which gradually separated and came away. The patient's intellects soon became clear, all fever left him, and he soon regained his usual state of health. In this case, I conclude, that the urethra had given way on its left side, in front of the fascia, which covers and binds down the parts beneath the skin of the perinæum, and in the vicinity of the abscess. I mention this opinion to lead us to form a probable conjecture as to the cause of the urine becoming diffused, in some cases, beneath the integuments of the pubes and abdomen.

When circumscribed abscesses form, it is probable, that the quantity of urine which escapes from the urethra is small, and that by its irritation it occasions adhesion of the surrounding cellular substance. In the case just related, the quantity must have been sufficient to have occasioned the death of a considerable quantity of cellular substance. When the urine is diffused, and injected into the cellular substance extensively, scarifications afford but an ineffectual outlet to it. The practice most appropriate to these cases would be, at as early a period as possible, to make a wound down to the aperture in the urethra, so that whatever urine may escape from the canal should run freely out of the wound, and be no longer forced to pervade the cellular substance. Yet it is difficult, nay, perhaps in some cases impossible, to know where the urethra has given way; and one object which

I had in view in relating these cases, was to induce others to reflect, and to endeavour to ascertain, by experience, how and where we ought in different cases, to make such wounds as will afford free discharge to the urine, and prevent the horrible effects of its becoming extensively diffused through the cellular substance. Our conjectures respecting the situation of the aperture, will be much assisted by the history of the case. If the swelling and inflammation began at the top of the scrotum, near the pubes, it is probable, that the diseased aperture of the urethra is in front of the perinæum; if it began on one side, it is probable, that the opening of the urethra is on that side. Were surgeons fully aware of the nature and urgency of the case, and bold enough to do what is required of them; that is, to cut through the swollen and inflamed parts, till they exposed the tube of the urethra, I am convinced many lives might be saved. If the integuments of the perinæum be affected, it is probable, that the aperture in the urethra is as far, or farther back than that part; yet respecting this point we may err, it frequently happening that the aperture in the urethra is far back, and yet the integuments of the perinæum may contain no urine, the fascia, which I have spoken of, preventing that fluid from affecting them.

I shall briefly relate two more cases to exhibit other varieties of these diseases.

### CASE.

A gentleman, who was more than seventy years of age, but of a strong constitution, who had never found any difficulty in voiding his urine till a few days before the occurrence, which I am about to relate, and who actually did void it freely in a full stream, after his urethra had given way, so as to al-

low of the escape of a considerable portion of the urine, was suddenly seized with shivering and severe indisposition. The patient did not complain of any thing being wrong about the scrotum, or urinary organs, till about two days, when he mentioned that his testicles were swollen. When I saw him, the scrotum and integuments of the penis were much distended and mortified on the surface in several large irregular black patches. The distention of the scrotum was not merely occasioned by urine, it was emphysematous also from air extricated by putrefaction. The integuments of the perinæum were scarcely affected. The patient said that the swelling had begun from behind, and on the left side. I concluded, that in this case, the urethra had given way in the perinæum, and that the urine had passed in the course of that canal, between it and the fascia, which I have spoken of, till it arrived at the loose cellular substance of the scrotum which it readily pervaded. I know this to have been the fact in some similar cases which I examined after death; and I conclude it to be owing to the resistance of a fascia spread beneath the skin, that the integuments of the perinæum are not affected, even though the urethra has given way beneath them. As the object of surgery is to make an external wound opposite to the orifice in the urethra, I pursued a practice in this case which I had found successful in several others of a similar nature, and which I was led to adopt, from discovering that the aperture in the urethra was, in some cases which I examined, much farther back than the part where the urine first appeared to have pervaded the cellular substance of the scrotum. I made a wound about two inches and a half in length, through the integuments and subjacent cellular substance of the perinæum and back part of the scrotum, in the direction of the urethra, but more to the left

side. The wound need not extend farther back than the bulb, and should, I think, come forwards so as to divide the integuments of the back part of the scrotum, where the swelling first takes place. The object of this wound is to lay bare the fascia of the perinæum, and the operator may now feel the groove which intervenes between the spongy substance of the urethra and the crus penis. Now, in cases of this description, I have proceeded to divide the fascia, which is spread over these parts, so that I could more distinctly pass my finger into the groove which is formed between them, and gently elevate the fascia from off the spongy substance of the urethra. I did so in the present case, and was anxious that the patient should void his urine, that I might see if it came through the wound which I had made, but he was unable at that time to discharge any. However, afterwards when he made water, it continued to pass freely through the wound in the perinæum.

Having formerly been perplexed with regard to such cases as I have last described, and having now operated in many similar instances, with the same event; that is, with a perfectly free discharge being afforded to the urine which escapes from its natural channel, I thought it might be useful to publish one of them, and I will add another of a different kind, to show the necessity and propriety of our endeavouring at once to give a free discharge to the urine, by making an external wound, which communicates with the aperture in the urethra.

CASE.

A gentleman, of seventy years of age, was affected with a kind of intermittent fever, for which he was attended by a physician, from whom he concealed that he had any disease of his urethra. After some weeks, however, the patient informed him one morning, that he had a slight swelling of one testis. On this account I was desired to see the patient, who resided a little way from London. The swelling of the scrotum at that time was not larger than a large apple; it was situated at the back part of the bag, and on the right side, and its appearance was very demonstrative of its nature; I urged the patient, but in vain, to permit me to divide the skin, but he said he would allow no operation to be done, unless in consequence of the opinion of other surgeons in consultation.

I found that he had for the greater part of his life been in the frequent habit of passing bougies for himself, and that he was uncertain of his ability to introduce even a very small one. As no consultation could be held on his case, till the following day, I called on the patient in the evening, taking with me an extremely small flexible varnished catheter, hoping that I might be able to pass it, or if I should fail, that I might be allowed to give a free exit to the effused urine. At that time, however, I found the whole scrotum uniformly distended to a very great size, and the integuments of the penis so swollen and projecting, that it was impossible, without an operation, to discover the orifice of the urethra. The patient having appointed other surgeons to attend on the subsequent day, was resolved to abide the result of their opinion, before he would submit to any wound being made. On the ensuing day, several large irregular mortified patches had formed on the integuments of the scrotum and

penis, and the patient was so sunk and confused in his intellects, that an operation was, I believe, deemed useless by all present, except myself. I knew the patient was in other respects healthy, and I had many times seen the whole skin slough off from the genitals, and the patients survive and do well. As, however, an operation was the only resource, it was performed. We drew the patient's legs and thighs out of bed, and turning him on his face, the perinæum presented itself in such a manner as to admit of my performing the operation. The integuments of the perinæum were now greatly swollen, which circumstance I had not observed before. I made a wound in the direction of the one made in lithotomy, and cut through between two and three inches of cellular substance œdematous with urine, before I could touch the bulb of the urethra, or other parts situated beneath them. I raised the tumid integuments from off the subjacent parts with my finger, but still no urine flowed. I then endeavoured to pass my finger by the side of the bulb towards the prostate, in the direction of the urethra; and in a few seconds, about three pints (as I should guess) of highly putrid urine, mixed with purulent matter, was suddenly and forcibly projected. Being now assured that the bladder could readily discharge the urine through the external wound, I cleansed and dressed the parts. The patient got into his bed without assistance, and expressed, with vivacity, all that comfort and relief which every one experiences from the evacuation of a much distended bladder. The mortified patches of skin separated, yet sufficient remained to give a covering to the genitals. Great quantities of mortified cellular substance came through the apertures left by separation of the superficial sloughs. I was able to introduce a very fine elastic catheter, and by enlarging its size, week-

ly, the urethra regained its natural calibre in all its parts; so that the patient voided his urine in a larger stream, and with more freedom and force than he had done for for fifty preceding years. It seems right however to add, that after two years, the stream having again diminished he had recourse to bougies, and met with opposition from the strictures which had contracted again during that interval.

# SURGICAL OBSERVATIONS

ON

# TUMOURS,

AND ON

# LUMBAR ABSCESSES.

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# SURGICAL OBSERVATIONS.

## *An Attempt to form a Classification of Tumours according to their Anatomical Structure.*

THE observations which I have had an opportunity of making in St. Bartholomew's Hospital, on the various tumours which occur in the human body, have been so numerous, that I have almost felt myself under the necessity of forming some classification of those diseases. This classification I have attempted according to their anatomical structure, which allows, at the same time, of a corresponding arrangement of those practical remarks that have been promiscuously collected. I have long felt so sensibly the advantages resulting from an orderly arrangement of this extensive subject, that I have taught it for some years in my Lectures in the manner exhibited in the following pages. I am far, however, from being satisfied with the method which I have adopted; but it is the best that I have been able to devise; and, at least, it has this utility, that it admits of a number of important cases being arranged in a perspicuous manner, and prevents that obscurity which a total want of order necessarily creates.

My motives for laying this paper before the Public are; first, a conviction, that an extensive knowledge of this subject, such a knowledge as would lead to an attempt at classification, and to ascertain the peculiarities which characterize the different species of tumours, can only be obtained by those who have very ample opportunities of observation. But it is probable that, when the subject in general has been surveyed, and its parts pointed out, those parts may be discriminated and examined with accuracy and advantage, by persons who have not had opportunities of contemplating the whole. 2dly, The minds of medical men having of late been laudably excited to investigate the nature of cancer, in hopes of discovering something serviceable in that dreadful disease, it becomes right to remark, and it will appear from the following account, that there are many local tumours and ulcers, as intractable in their nature, and destructive in their progress, as cancer, which are liable to be confounded with that disease, but which ought to be distinguished from it, before any progress can be made in this difficult part of medical science. The society for the investigation of the nature of cancer have inquired about the anatomical structure of that disease, and about other disorders which have a resemblance to it. In the present paper I have attempted to reply to such interrogations, as far as my knowledge enables me. It appears to me, that, in order fully to investigate any subject with advantage, a great deal of collateral knowledge is required, which serves, like light shining from various places, to illuminate the object of our researches. I am not without hopes that this paper will tend to point out the required distinctions, and furnish such collateral knowledge.

In engaging in a new undertaking, I am likely to expose my own deficiencies of information; and by adopting a new and perhaps injudicious arrangement, and employing new and perhaps unfit terms, I may lay myself open to criticism and censure. I am not unwilling, however, to encounter these risks, when I have it in view to bring a difficult and interesting subject fairly before the public; in hopes that, by exciting the attention and engaging the labours of many persons, it may, at length, acquire that perfection of which it is susceptible, and which could never be brought about by the exertions of a few individuals.

The subject of tumours occupies a considerable space in the works of the ancient writers on medicine. They seem, however, to have considered the subject, rather with regard to its name than its nature; for we find a great variety of dissimilar diseases collected, I cannot say arranged, under the same general title. The error has descended to us, and even in Dr. Cullen's Nosology we find diseases of arteries, veins, glands, tendons, joints, and bones, brought together under one order, and designated by the same name of *tumours*. Some of these also are merely enlargements of natural parts; whilst others are entirely new productions, having no existence in the original composition of the body. We have, I believe, sufficient knowledge of the nature of these diseases to class them more scientifically; and as this has not yet, as far as I know,* been done, I shall endeavour to supply the deficiency.

* Plenck published, 1767, a work intitled "Systema Tumorum," which I have not seen, but I conclude that it does not resemble the present attempt; since no arrangement, like that which I have made, is to be met with in the Encyclopédie Methodique.

In the definition which I mean to give of tumours, I shall trespass as much against the usual import of the word, as nosologists have hitherto done in their classifications against the nature of the disease. For I shall restrict the surgical signification of the word "Tumour" to such swellings as arise from some new production, which made no part of the original composition of the body; and by this means I shall exclude all simple enlargements of bones, joints, glands, &c. Many enlargements of glands are however included in the definition, as they are found to be owing to a tumour growing in them, and either condensing the natural structure, or causing the absorption of the original gland. Sometimes also the disease of the gland seems to produce an entire alteration of structure in the part; the natural organization being removed, and a new-formed diseased structure substituted in its stead. In either of these cases the disease of the gland is designed to be included in the definition; and the practical remarks which follow will equally apply to the same kind of diseased structure, whether it exist separately by itself, or occupy the situation of an original gland. The structure of tumours is also a part of morbid anatomy which deserves to be examined; since (as it did not come within the scope of the undertaking) it has not been fully discussed by Dr. Baillie in his very valuable treatise on that subject. Yet as he has given representations of glandular parts enlarged by a diseased structure of an entirely new formation; so I shall have the advantage of referring the reader to his accurate and expressive representations of some of those appearances which it is my purpose to describe. There is an observation of this judicious and accurate writer which I shall take the liberty of inserting, since it justly

appreciates the degree of utility of investigations like the present: he observes, "that the knowledge of morbid structure does not lead with certainty to the knowledge of morbid actions, although the one is the effect of the other; yet surely it lays the most solid foundation for prosecuting such inquiries with success. In proportion, therefore, as we shall become acquainted with the changes produced in the structure of parts from diseased actions, we shall be more likely to make some progress towards a knowledge of the actions themselves, although it must be very slowly."

The incipient state of tumours will naturally first engage our attention; and those, which perhaps form the best example and illustration of the subject, are such as hang into cavities from the membranous surfaces which form their boundaries. The cause of tumours having a pendulous attachment attracted the attention of Mr. Hunter, who made the following remarks on the formation of one on the inner surface of the peritoneum, as is related by Mr. Home in the Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, Vol. i. p. 231. "The cavity of the abdomen being opened there appeared, lying upon the peritoneum, a small portion of red blood recently coagulated; this, upon examination, was found connected to the surface upon which it had been deposited by an attachment half an inch long, and this neck had been formed before the coagulum had lost its red colour." Now had vessels shot through this slender neck, and organized the clot of blood, as this would then have become a living part, it might have grown to an indefinite magnitude, and its nature and progress would probably have depended on the organization which it had assumed. I have in my possession a tumour.

doubtless formed in the manner Mr. Hunter has described, which hung pendulous from the front of the peritoneum, and in which the organization and consequent actions have been so far completed, that the body of the tumour has become a lump of fat, whilst the neck is merely of a fibrous and vascular texture. There can be little doubt, but that tumours form every where in the same manner. The coagulable part of the blood being either accidentally effused, or deposited in consequence of disease, becomes afterwards an organized and living part, by the growth of the adjacent vessels and nerves into it. When the deposited substance has its attachment by a single thread, all its vascular supply must proceed through that part; but in other cases the vessels shoot into it irregularly at various parts of its surface. Thus an unorganized concrete becomes a living tumour, which has at first no perceptible peculiarity as to its nature; though it derives a supply of nourishment from the surrounding parts, it seems to live and grow by its own independent powers; and the future structure, which it may acquire, seems to depend on the operation of its own vessels. When the organization of a gland becomes changed into that unnatural structure which is observable in tumours, it may be thought in some degree to contradict those observations: but in this case the substance of the gland is the matrix in which the tumour is formed.

The structure of a tumour is sometimes like that of the parts near which it grows. Those which are pendulous into joints, are of a cartilaginous or osseous fabric; fatty tumours frequently form in the midst of adipose substance, and I have seen some tumours growing from the palate, and having a slender attachment, which in structure resembled the palate. Sometimes, however, they do not re-

semble in structure the parts from which they grow. The instance just mentioned, of the pendulous portion of fat growing from the peritoneum, will serve as a proof: the vessels, which had shot into it, made the tumour into fat, whilst the neck was of a fibrous and vascular structure. I have seen osseous tumours unconnected with bone or periosteum; and indeed, in general, the structure of a tumour is unlike that of the part in which it is produced. Therefore we seem warranted in concluding, that in many cases the nature of the tumour depends on its own actions and organization; and that, like the embryon, it merely receives nourishment from the surrounding parts.

If, then, the coagulable part of the blood be from any cause effused, if the adjacent absorbents do not remove it, and the surrounding vessels grow into it, the origin of a tumour may be thus formed. It may be right to reflect a little on the causes which may occasion a deposition and consequent organization of the coagulable part of the blood; as such reflections throw light on the nature and growth of tumours, and lead to the establishment of principles, which are applicable to tumours in general. The deposition of the coagulable part of the blood may be the effect of accident, or of a common inflammatory process,* or it may be the consequence

* It will probably be useful to illustrate this subject by the recital of a case:—

CASE.

A medical practitioner bruised the upper part of his thigh against the pummel of a saddle, in consequence of his horse starting. The bruise and slight inflammation attendant on this accident soon disappeared, but after some months, he perceived a small tumour, which gradually increased, till it acquired a considerable magnitude. He came to London, and

of some diseased action of the surrounding vessels which may influence the organization and growth of the tumours.

In the former cases, the parts surrounding the tumour may be considered simply as the sources from which it derives its nutriment, whilst it grows apparently by its own inherent powers, and its organization depends upon actions begun and existing in itself. If such a tumour be removed, the surrounding parts, being sound, soon heal, and a complete cure ensues. But if a tumour be removed, whose existence depended on the disease of the surrounding parts, which are still left, and this disease be not altered by the stimulus of the operation, no benefit is obtained: these parts again produce a diseased substance, which has generally the appearance of fungus, and, in consequence of being irritated by the injury of the operation, the disease is in general increased by the means which were designed for its cure. It appears therefore that in some cases of tumours, the newly formed part alone requires removal, whilst in others the surrounding substance must be taken away, or a radical cure cannot be affected.

There is yet another circumstance deserving attention, before I proceed to the particular consideration of the subject; which is, that a tumour once formed, seems to be a sufficient cause of its own continuance and increase. The irritation, which it causes in the contiguous parts, is likely to keep up that increased action of vessels which is necessary to its supply; and the larger it becomes, the

had it removed. It was an adipose tumour, and had a distinct capsule inclosing it, formed by the condensation of the cellular substance in which it had grown.

more does it stimulate, and of course contribute to its own increase.

Suppose then a tumour to have formed, and increased; it will continue to grow and to condense the surrounding cellular substance, and thus acquire for itself a kind of capsule. Tumours are more closely or loosely connected to the surrounding parts; which circumstance seems to depend upon the degree of stimulus which they occasion, and the inflammation which they thus excite. This irritation perhaps may be the cause why some tumours, which are slow in their first increase, grow rapidly after they have acquired a certain size.

These preliminary observations will be referred to, when the different kinds of tumours are described. When the history of different kinds of tumours is spoken of, there will be frequent necessity to advert to the effects of medical treatment upon them; it therefore seems right to premise a few words upon that subject.

It can scarcely be doubted that when tumours form and grow, there exists an increased state of action in the adjacent vessels, and the first curative intention in these diseases will therefore be to repress as much as possible this unusual exertion of the vessels, which gives rise to the formation of a tumour, and, by its continuance, causes its increase.

I know of no local measures to diminish an increased or inflammatory action of any part of the body more rational in theory, or more efficacious in practice, than those of taking away the two great causes of animal actions, the blood and heat of the disordered part. The former is generally accomplished by means of leeches applied in its vicinity, which should be repeated as circumstances indicate; and the latter, by the application of folded linen,

wetted with sedative lotions, by which a continual evaporation and constant abstraction of heat is kept up from the surface of the skin. The effect of this last mode of treatment is much more considerable than at first sight might be supposed. It operates on parts far beneath the surface. As heat is so transmissible a substance,* so in proportion as the temperature of the skin is diminished by evaporation, it derives heat from the subjacent parts, and thus are their morbid actions lessened.† If by such means the growth of a tumour be suspended, another curative indication naturally arises, which is to promote the absorption of the new formed substance.

This indication is generally attempted by the use of stimulants, such as frictions with mercurial ointment, pressure, and electricity, or by means which also excite some counter irritation, as rubefacient plasters, solutions of salts, blisters, and issues. Both reason and experience equally demonstrate the impropriety of using the stimulating

* Though this expression may not be correct, the idea which is designed to be conveyed by it, will, I believe, be understood.

† The regulation of the temperature of diseased parts, seems to be an important object in the treatment of local diseases; and it is very possible, that by producing evaporation from the surface we may chill them. Patients, therefore, ought to be apprised, that our object in the use of evaporating washes, is merely to prevent an unnatural degree of heat. It is not necessary that the washes should be applied cold to accomplish this object. A chilly sensation imparted to a portion of the skin may affect the whole surface, and produce that affection which we call a cold. In many cases, a bread and water poultice seems to me the best application we can employ, both with a view to abstract superfluous heat, and on account of its soothing properties. It is indeed a local warm bath, and, like the bath, it induces a gentle perspiration from the surface.

plan till the disease is first tranquillized, and in a degree subdued. It is reasonable to expect that stimulating measures will increase the actions, which are going on in the diseased part; and experience proves that diseases are often increased by those very means which, had they been employed at a proper time, might have effected their cure. This may be elucidated by a fact which is, I believe, generally known and admitted, that if a blister be applied for the cure of a pleurisy before evacuations are made use of, and the activity of the disease be thus checked, it aggravates the disease; if afterwards, it speedily effects a cure. If a tumour or any local disease be for a time benefited by stimulating discutients, and the diseased actions recur in it with a degree of activity; it is better to desist from this latter plan of treatment, and adopt again the former one, till the disease is by such means rendered inactive.

I am so well convinced of the necessity of attending to the time and circumstances in which these remedies are applied in order to give them their real efficacy in the cure of local diseases, that I have been induced to dwell longer on this subject than may perhaps to some seem necessary.

When a blister is made permanent, or a seton or issue is made in the vicinity of a disordered part, it is in fact producing a new but curable disease, in order to detract from an old one, over which we have less control. But here the same observations apply. We should not produce a new disease till the active state of the original one is diminished, and till it is, as it were, rendered dormant; for otherwise the irritation of the intended remedy will rather tend to the aggravation than the cure of the disorder; it will also increase the febrile disturbance of the constitution, by adding

to the causes of irritation. It should also be borne in mind, that the intended remedy is a disease of our own creating; and, if it be a painful one, that it may, by disturbing the constitution, do more harm in this way to the original disease than good by its counter-irritation.

Such are the local means of treating tumours, as well as other local diseases, and to these I shall have occasion to refer. I cannot speak of the general means usually employed to operate on these disorders without entering into a long, and, I think, an unnecessary discussion.

In attempting a classification of tumours, I shall suppose that they may be made to constitute an Order in the class of local diseases in nosology; and the meaning of the word may be restricted, in the manner suggested, to substances of new formation, which made no part in the original structure of the body; the order may then be divided into genera, and the first genus may be denominated from its most obvious character, (that of having a firm and fleshy feel,) Sarcoma, or Sarcomatous tumours.

This genus contains many species, to a description of which I next proceed. The first of which I shall treat, being apparently composed of the coagulable part of the blood, rendered very generally vascular by the growth of vessels through it, without having any noticeable peculiarity in their distribution, may therefore be called

### *Common Vascular, or organized Sarcoma.*

The names by which I have distinguished the different species of sarcoma have been objected to, because they are derived from internal circum-

stances, and not from any information, which can be acquired prior to an operation. I have not, however, been able to devise any better mode of denominating these tumours: for all the species must agree in the external characters, those of an increase of bulk, and a fleshy feel. If, however, an arrangement of tumours were once made, so that the history of each species could be particularly remarked, we might perhaps be able, from this circumstance, to form a probable opinion of the nature of the tumour, and of the mode of treatment which it would require; and, by adverting to the structure of the removed tumour after an operation, we might determine whether it would be right to remove or leave the contiguous parts. It is designed, then, to include under this title all those tumours which appear to be composed of the gelatinous part of the blood, rendered more or less vascular by the growth of vessels through it.

The vessels which pervade this substance are, in different instances, either larger or smaller, more or less numerous: they are distributed in their usual arborescent manner, without any describable peculiarity of arrangement. This kind of tumour seems to be the most simple in its nature; many, perhaps all, of the varieties of tumours, were at first of this nature. The fatty tumour lately mentioned was doubtless at first a common vascular substance; but the vessels secreted fat in the body of the tumour, whilst the neck underwent no such change.

They are such tumours, then, as are organized throughout, but without distinguishable peculiarity of structure, that are meant to be considered under this title. This structure is met with not only in distinct tumours, but likewise in the testis, mamma, and absorbent glands. In the testis I have seen the

vessels, very numerous and small, dispersed through every part of the tumour. In the mamma they seem to be rather large than numerous, and the organization appears less complete.

When this kind of tumour has attained a considerable size, the superficial veins appear remarkably large; on which account, together with their curiously meandering course beneath the skin, they cannot fail to attract attention. Perhaps the weight of the tumour compresses the deeper seated veins and obliges the blood to return in larger quantities through those nearer the surface; or perhaps these vessels undergo a kind of sympathetic enlargement; for they do not appear to be distended by the blood which they contain.

These tumours are generally dull in their sensation; enduring even a rough examination by the hand, and electric shocks, without becoming painful. I suspect that it is this kind of sarcoma, which sometimes, though rarely, suppurates; but as, when that event takes place, even partially, the rest of the substance is, in general, speedily removed by absorption, I have had no opportunity of ascertaining this circumstance.

These tumours generally grow till the skin is so distended that it ulcerates, and exposes the new-formed substance; which, being as it were obliged to inflame, and not being able to sustain disease, sloughs and falls out; sometimes portions seem to be detached, and come away without sloughing. In this manner is the disease occasionally got rid of; but such is the constitutional irritation attending this process, and the disgusting fœtor and frightful appearance of the part, that the surgeon generally recommends, and the patient submits to its removal at this juncture.

As cases will probably convey more information

in less words than description or narrative, and as they identify the kind of disease which is meant to be described, and inform, as it were by example; I design to relate one or more cases of each kind of tumour, and thus curtail as much as I can my description of them.

CASE I.

A woman, between forty after fifty years of age, was admitted into St. Bartholomew's Hospital, on account of a considerable tumour which had grown on the inside of the knee, and had so concealed the tibia, that it could not be felt. She remembered it when of the size of an egg, but could give no information to our enquiries, whether in that state it was fixed to the bone, or moveable upon it. It measured two feet in circumference, and had been gradually increasing between three and four years. The veins were large, and formed an appearance like network on the surface.

As the tumour advanced in size it had gradually prevented her moving about till it entirely confined her to her bed. In this situation it was not painful till within half a year before her admission into the hospital; when, from the sense of distension of the skin, and the inflammation induced in that part, she became restless and feverish, and lost her flesh considerably. At length, the skin ulcerated, and the exposed tumour inflamed and sloughed at different times, so as to leave a cavity in it of the size of a pint bason. From the sides of this cavity there was poured forth a most copious and fœtid discharge: she had frequently lost blood from the vessels laid open by ulceration or sloughing; and, on her admission into the hospital, she had a con-

firmed hectical fever, through weakness and irritation.

The state of the patient's health, the magnitude of the tumour, the uncertainty of its origin, (for it was supposed to have arisen from a diseased bone,) made amputation appear the only means of preserving life. Upon an examination of the amputated limb, which was previously injected, this tumour was found to have no connection with the bone or joint upon which it lay. The lower part of the tumour was covered by a thin capsule, made apparently of condensed cellular substance, and it was loosely connected to the parts on which it lay; but on the surface of the tumour next the skin the capsule firmly adhered to it in consequence of the inflammation which had taken place. The substance of which the tumour was composed appeared to have been originally of a coagulable nature, and the vessels which ramified throughout it, appeared to be rather large than numerous: yet this appearance might have arisen from an imperfect injection.

This single case is sufficient to convey all the general information on this subject, which I have obtained. It is unnecessary to add parallel instances, and I am unwilling to load the account with minute particulars, lest they should obscure the principal facts. Probably from the want of knowledge I may have included, without discrimination, many varieties in this species of tumour; and, perhaps, further observations will furnish more specific distinctions in these diseases. The subject is but begun; and the difficulty of the investigation will, I hope, apologize for the small advances which I have been as yet able to make.

### *Adipose Sarcoma.*

This is a very common species of sarcomatous tumour, and is formed most commonly on the front, or back part of the trunk of the body, and sometimes in the extremities.

Although it is generally formed in the midst of cellular and adipose substance, there can be little doubt that its origin is like that of other tumours; that, in the first instance, it was coagulable lymph, rendered vascular by the growth of vessels into it, and that its future structure was the consequence of their arrangement and actions. That this was the case in the pendulous tumours mentioned in the preliminary observations (page 170) seems to be certain.

The distinct origin of such tumours is made sufficiently evident, by observing, that they have always a thin capsule of common cellular substance, which separates them from the contiguous parts. This capsule seems merely to be the effect of that condensation of the surrounding cellular substance, which the pressure of the tumour occasions. As the growth of adipose tumours is regularly and slowly progressive; as nothing like inflammation in general accompanies their increase; their capsules afford a striking instance of an investment acquired simply by a slight condensation of the surrounding cellular structure, unaffected by inflammation. The capsule, which is very thin, adheres but slightly to the tumour: and the principal connection appears to be by vessels, which pass through it to enter the substance of the tumour. These vessels are so small and the connection so slight, that no dissection is required to separate it; for when the tumour is to be removed, the hand of

the operator can be easily introduced between it and its investment, and it is thus readily turned out of its capsule.

The vessels of adipose tumours are neither large nor numerous; they are readily torn when the separation alluded to is attempted, and they scarcely bleed after it has been effected. It is natural to suppose when the greater part of a large tumour has been detached, and no vessel of consequence has been divided, that some principal nutrient artery will afterwards be met with; and this supposition produces an unnecessary hesitation on the part of the operator. There is indeed no species of tumour that can be removed with so much celerity, with such apparent dexterity, or with such complete security against future consequences, as those of an adipose nature. In some instances, however, when inflammation has been induced, the capsules even of these tumours are thickened, and adhere so as not to be separable without difficulty from their surface. To certify this remark I may mention the case of a man who had an adipose tumour growing beneath the skin of the nates, in which the pressure from sitting occasioned inflammation, and this kind of tenacious adhesion of the capsule to its surface. This circumstance made the separation of the skin from off its surface difficult, when the extirpation of the tumour was undertaken; but, after that was accomplished, the base of the tumour was lifted up and removed with great facility, and almost without the use of the knife. The under part of this tumour had not a regular surface, but projected in portions so as to have a lobulated appearance; a circumstance which is not unfrequent, and which deserves to be mentioned. From the occurrence of inflammation likewise these tumours sometimes adhere to the contiguous parts;

of which circumstance the case which I am about to relate affords a curious example.

I have known several fatty tumours growing at the same time, in different parts of the body of the same person.

I shall take the liberty of giving an account of the extirpation of a very large tumour of this kind; as the case is particularly interesting, and shows that the circumstances usually met with are unaltered by the size of the tumour.

CASE II.

A healthy middle-aged man had a tumour formed apparently beneath the fascia of his thigh, which he remembered when it was no bigger than an egg. It had increased by a regular and slow progress, in little more than four years, to a very great magnitude, such as may be easily supposed, when it is told, that it weighed, after removal, between fourteen and fifteen pounds. It had been attended with no pain during its increase, and was now only inconvenient by its bulk.

The surgeons who first saw this patient would not undertake any operation, feeling an uncertainty as to the nature and connections of the tumour; though they all agreed that, when the skin gave way, there was but little chance of the poor man's surviving the consequences of such an exposure. Considering from the history of the case, that the tumour must have been removeable in the first instance; believing, from its freedom from pain and irritation, that it was of no malignant nature, and that an operation was only alarming from its magnitude; I recommended the patient to see the most eminent surgeons in London, before he returned

in despair to the country, from whence he had come for relief. Mr. Cline gave him more direct hopes of success than he received elsewhere, and he went into St. Thomas's Hospital to submit to the operation.

When Mr. Cline had divided the skin and fascia of the thigh, the tumour was easily turned out; but it had unfortunately acquired a ligamentous adhesion to the orbicular ligament of the hip, which could not be separated without, in some degree, injuring that part. This attachment appeared to be about half an inch in breadth and about one-fourth of an inch in length. The cause and nature of this firm attachment to the ligament of the hip, seems the only circumstance peculiar to this case, or requiring explanation. It appears to me easily accounted for, by supposing the tumour to have compressed and irritated that part, and thus to have occasioned an adhesion, at first of a glutinous nature, but which afterwards becoming organized, had assumed the structure of the parts, from whence it proceeded. In like manner tumours growing near, and compressing the surface of bones, frequently occasion a degree of exostosis.

No hemorrhage followed the removal of the tumour. The wound at first appeared disposed to do well; but the patient became feverish, and it did not unite by adhesion. There were also some symptoms indicating inflammation about the hip-joint. The man, however, surmounted these difficulties, and, after some months, was discharged from the Hospital.

There were two circumstances in the operation attended with danger; one, the size of the wound, which could hardly be expected to unite by adhesion, on account of the irritation which, from its

extent, must be created; the other, this unlucky attachment to the ligament of the joint. It is to be lamented, that a disease, so readily removable in its commencement, should have been suffered to acquire a magnitude, which alone was a source of danger.

Since the publication of the first edition of these observations, I have seen an abscess form in the substance of an adipose tumour. Earthy matter was also deposited on the sides of the cavity which had contained the pus. I have also seen osseous matter deposited within the substance of an adipose tumour.

### *Pancreatic Sarcoma.*

The next species of sarcomatous tumour, which I shall describe, resembles in appearance the pancreas, and, on that account, may be named (if the etymological import of the word be not considered as prohibitory) Pancreatic Sarcoma.

This new-formed substance is made up of irregularly shaped masses; in colour, texture, and size resembling the larger masses which compose the pancreas. They appear also to be connected with each other, like the portions of that gland, by a fibrous substance of a looser texture. This kind of sarcoma, though sometimes formed distinctly in the cellular substance, more frequently occurs in the female breast, perhaps originating in lymphatic glands; and, as cases of this kind sufficiently illustrate its nature and progress, and appear more interesting in proportion to the importance of the parts concerned, I shall select some instances of it, in this part, to show those circumstances which seem most important in the history of this species of sarcoma.

I shall, however, first relate a case of this diseased structure occurring in the lymphatic glands beneath the lower jaw, and afterwards speak of its progress, when it takes place in or near to the female breast.

CASE III.

A man came to St. Bartholomew's Hospital from Oxfordshire, with three diseased lymphatic glands, each of the size of a very large plum. They were situated beneath the basis of the jaw, upon upon the mylohyoideus muscle. They resisted the attempts which had been made to discuss them; and had not been removed from an apprehension that a dangerous hemorrhage would take place in the operation. The glands had gradually, though very slowly, attained their present magnitude, for the disease was of fifteen years' duration. The surrounding parts were not affected. Sir Charles Blicke undertook and accomplished the removal of the diseased gland, the structure of which was exactly such as has been described. This case is related in the first place, as it shows most clearly the usual characteristics of this species of diseased structure; which are those of slowly increasing, of not being prone to inflammation, or tending to suppuration.

It may not be improper to mention, though it is irrelevant to the present subject, that, in the operation, the external maxillary artery was unavoidably divided. It did not, however, bleed immediately after the operation, so that this circumstance was not perceived; and the edges of the wound were brought together by one suture, and accurately and firmly closed by sticking-plaster. Shortly afterwards the patient felt a sense of choking, which

increased to a state almost of complete suffocation. Indeed it seems probable that this might really have happened before any one could have come to his assistance, had not some of the plasters fortunately given way, and afforded some discharge to the blood: for a very great quantity of coagulated blood had collected within the wound, and compressed the trachea and pharynx to a greater degree than would readily be believed by those who had not witnessed the fact. This circumstance is mentioned to show the impropriety, when there is any chance of hemorrhage, of closing wounds so strictly by sticking-plaster, as to allow no exit to any blood that may be effused; and it is particularly unsafe in circumstances similar to those of the foregoing case. If the hemorrhage be but small in quantity, and the escape of the blood be prevented, it separates the sides of the wound which should lie in close contact, and thereby prevents their immediate union; and, if it be considerable, it deserves to be remarked, that, so far is the compression which the confined blood must make on the arteries, from which it was poured, from stopping the bleeding, that it seems to be a stimulating cause, exciting an hemorrhagic action in the vessels. This remark is manifested by the present, as well as by many other cases in surgery.

This kind of sarcoma frequently forms amidst the mammary gland, a little above, and on that side of the nipple, which is next to the arm. Its appearance would lead one to suppose, that it was a lymphatic gland, which is usually found in that situation, converted into this structure; but sometimes it seems like a distinct tumour. It is the appearance of the capsule which invests the tumour, that has led me to form these opinions.

These tumours lessen in bulk if judiciously treated; but if they cannot be entirely dispersed, they increase gradually: and when they have attained some considerable size, they are generally removed, from apprehension of the consequences which they might produce, if they were suffered to remain. If the tumour be indolent, and if it increases slowly, the parts surrounding it, and the glands in the axilla are not affected. But some tumours formed by this kind of diseased structure, which do not unfrequently occur in the breast, are, contrary to the ordinary properties of such diseases, of a very irritable nature, occasioning severe and lancinating pain, and producing an inflammatory state of the skin which covers them, so that it becomes adherent to their surface. They also irritate the absorbents leading to the axilla, and produce enlargement of their glands. From these circumstances I suspect that these tumours may be frequently considered as cancers. These extremely irritable tumours do not generally attain any considerable magnitude; they are reduced in size by the treatment which has been mentioned, but increase again, when it has been desisted from. Sometimes a tumour of this nature, which was irritable in the first instance, becomes indolent after the activity of the disease has been checked by proper local applications, but in other cases the irritability of the disease recurs. The pain is lancinating, and so severe as to make the patients feverish, grow faint frequently, and lose their muscular strength. When the axillary glands become affected, one generally swells at first, and is extremely tender and painful; but afterwards the pain abates, and it remains indurated: another then becomes affected, and runs through the same course. I remember an instance where many of the glands attained a considerable

magnitude. The case was considered as cancerous, and the tumour, which was of the structure that has been described, and also some of the diseased glands, were removed, but several were left, and the patient did well.

CASE IV.

A young woman, who lived with me as a servant, suffered for more than two years severe pain, and considerable constitutional indisposition, from a tumour of this kind, which had caused inflammation and enlargement of three of the axillary glands. Being assured that it was not carcinomatous from its diminution under surgical treatment, I waited in hopes that some beneficial change would spontaneously take place; but, at last, by her request, and with the coinciding opinion of Sir Charles Blicke, I removed the original tumour, leaving the diseased glands in the axilla. The source of irritation being taken away, the glands gradually subsided, and the patient soon grew fat, and became, and remained remarkably healthy. I have known many similar cases.

When the above account was written, I was unacquainted with those facts recorded in the first volume of these observations, which show that considerable tumours of the breast and neighbouring parts, which resist all locally repellent measures, may be dispersed in many instances readily, by correcting a disordered state of the digestive organs. I have no doubt, but the occasional fits of pain and languor, which were experienced in the case just related, were the effects of irritability of constitution, and might have been relieved, and prevented, by means that would have given tone and tranquillity to the system.

CASE V.

A lady, about twenty-seven years of age, had a tumour between the breast and the axilla, which had gradually increased during a year and a half to the size of a goose egg. Its growth had been accompanied with occasional fits of pain. She had a much furred tongue, and costive bowels. As no discutient remedies had checked the progress of the tumour; and, as some apprehensions that its nature might be malignant were entertained, I was requested to remove it.

After I had done so, on dividing the tumour, its structure was found to be of that kind which I have described in this section; which induced me, for the comfort of the patient, to assure her, that the disease was not cancerous, and therefore not likely to return. The patient resided in the country, and when she left town, I exhorted her to be very attentive to her diet, and to the regulation of the functions of her digestive organs. After two years, she came from the country much alarmed, by a good deal of thickening irritation and redness, which had taken place in the parts wounded in the operation; all of which, however, soon subsided, under the application of a bread and water poultice during the night, and the use of alterative doses of mercury. In another year she returned again frightened by the occurence of a swelling, attended with uneasiness, on the side opposite to that on which the operation had been performed. The swelling was situated between the breast and the axilla, parallel and contiguous to the margin of the pectoral muscle. It was as big as a small walnut; and, I have no doubt, was caused by the tumefaction of an absorbent gland. It was dispersed

by the same treatment that had been instituted for the irritation which had taken place about the wound. About three years have now elapsed, and though she has been occasionally alarmed by pains, yet no other manifestations of disease have appeared.

As I have preserved no notes, and do not perfectly recollect any case, of a tumour of this structure occurring in a distinct form, unless some of those about the breast may be so considered; and as I wish to show that all these diseases occur distinctly as well as in glands, I shall, as an instance of a pancreatic appearance in a distinct tumour, refer the reader to the curious case published in London by Dr. Bouttatz, of Moscow, of a tumour which grew beneath the conjunctiva of the eye, and protruded it between the eyelids. The tumour was seven inches long and three inches and a half in circumference, and weighed two pounds and a half. The structure, which is represented in a plate, answers correctly to that which I have denominated pancreatic; and it had also the ordinary characters of this diseased structure, which are those of slowly and regularly increasing, not being prone to inflammation, nor tending to suppuration. The tumour, as might be naturally supposed, was closely connected with the tunica conjunctiva against which it pressed, but the base of it was easily elevated from the cornea which still retained its natural transparency, and the patient regained his sight on its removal.

### *Cystic Sarcoma.*

The next species of sarcomatous tumour, as it contains cells or cysts, may be named Cystic Sarcoma; and this species will be found to compre-

hend varieties. This species sometimes occurs as a distinct tumour, but is more frequently met with in the testis and ovary. In one kind of disease of the testis, the part is perhaps enlarged to six times its natural size, and consists of a congeries of cells, containing a serous fluid; their size is that of currants or grapes, but of an oval figure. The sides of the cysts are so vascular as to be made red by injection; and sometimes the injection is even effused and tinges the contents of the cyst. Dr. Baillie has favoured us with an elegant and correct representation of this disease, in his Series of Engravings intended to illustrate the Morbid Anatomy of some of the most important Parts of the Human Body.* I have known this alteration of structure the consequence of a blow received on the part; but, in general, it occurs without evident injury. The firm or sarcomatous part of an ovary affords a good specimen of the structure I am describing; the cells are here much larger, and are so vascular as to be made quite red by injection.

To show that this structure is not peculiar to these parts, I may mention the following case: a tumour was taken from the face of a boy by Sir Charles Blicke, which, when divided, was found to consist entirely of an assemblage of cells filled with a watery, yet coagulable fluid.

In the testis, cysts are not unfrequently found containing a kind of caseous substance. In this case too, the sides of the cyst are vascular. The cysts are generally large, and sometimes there is but one. I have called the substance caseous, because it resembles cheese in consistence, and in colour; being of a yellowish cast, and of an unctu-

* *Vide* Fasc. 8. Plate 8. Fig. 2.

ous appearance; but it is not at all unctuous to the touch. It may be proper to mention, that this caseous substance is sometimes irregularly distributed throughout the vascular substance of a diseased testis, without being confined in distinct cysts. I believe this kind of sarcocele is particularly unyielding to medical treatment.

### *Mammary Sarcoma.*

There is a species of sarcomatous tumour, which indeed I have not frequently met with, but which so strikingly resembles the mammary gland in colour and texture, that, wishing to distinguish it on account of the following case, I have named it Mammary Sarcoma.

I have seen this substance (which is white and firm, and has a similarity of appearance throughout) in the midst of adipose tumours; but my attention was not particularly excited to it till the following case occurred.

#### CASE VI.

A moderately healthy middle-aged woman came from the country to St. Bartholomew's Hospital, on account of a tumour of the size of a very large orange, which had grown gradually on the front of her thigh: it lay beneath the integuments and above the fascia. It was removed by an operation, and the integuments covering the tumour were also taken away, as in the removal of the cancerous breast. The sides of the wound were brought together by sticking plaster, and, at first, seemed disposed to heal; but afterwards a considerable induration of the surrounding parts took place,

and the wound degenerated into a malignant ulcer which spread extensively, and was incorrigible by any medical means employed. As the ulcer spread, so, in the same proportion, did the hardness of the parts which surrounded it. The pain and fever so exhausted the patient, that in about two months she died.

This tumour, the appearance of which was exactly of the kind that has been described, seemed to have no distinct capsule, but to be gradually lost in the surrounding parts. The whole of the diseased part seemed to have been removed, yet it is probable that the contiguous parts had a disposition to disease, which was aggravated, and rendered more malignant, by the injury of the operation. Could the circumstances have been foreseen, it might have been right to have removed the parts surrounding this tumour more extensively, as suggested in one of the preliminary observations.

There is a similar kind of diseased structure, but of a softer texture, which is frequently found as a distinct tumour, or in glandular parts perhaps; which might with propriety be considered as a variety of the same species of sarcoma. It has the same uniformity of surface, but it is not always of a white colour, being occasionally of a a brownish or reddish tint. I have seen a substance of this kind forming a tumour surrounding and compressing the œsophagus, and causing a contraction of that tube. I have seen this kind of sarcoma in glandular parts, in which the progress and event of the case did not indicate the disease to be of a noxious nature. The general result of my observations, however, has induced me to believe, that this diseased structure is prone to degenerate into an intractable ulcer, which will communicate its disease to the surrounding parts, and

I have therefore placed this species of sarcoma between those which seem to possess no malignity, and those which follow, and which are of a very destructive nature.

I add the relation of a case which occurred at St. Bartholomew's Hospital, since the publication of the former edition of this paper.

CASE VII.

A woman about fifty years of age, had a tumour growing beneath the skin of the perinæum, that by the side of the rectum, and that which is external to the labium. It was about seven inches in length, about two in breadth, and descended as low as the middle of the thigh. Sir Charles Blicke removed it, by dividing the skin on either side of the tumour lengthwise, at the upper part of it. He then dissected out the upper part of the tumour, which was thin, from beneath the divided integuments, and brought the parallel edges of the skin together by two sutures. The tumour, when removed, being divided, appeared firm, white, and smooth, and strikingly resembling the mammary gland. It had no distinct capsule. The integuments adjoining to the tumour inflamed, and indurated, and ulcerated, and a very large and foul sore was formed. The patient's health became greatly deranged, so that little or no hopes were entertained of her recovery. However, after a time, the disease ceased to spread, and at the end of about three weeks began to amend. The constitution became tranquil in proportion, and the sore slowly healed.

### *Tuberculated Sarcoma.*

The next species of sarcoma, which I have to describe, may be named Tuberculated Sarcoma. It consists of an aggregation of small, firm, roundish tumours, of different sizes and colours, connected together by a kind of cellular substance. The size of the tubercles is from that of a pea to that of a horse-bean, or sometimes larger; the colour of a brownish red, and some are of a yellowish tint. In Dr. Baillie's plates there is one of the tuberculated liver,* which expresses the appearance of this kind of sarcoma as well as can possibly be done by an engraving.

The instances which I have seen have been chiefly in the lymphatic glands of the neck. The tumours have ulcerated; have become painful and intractable sores; and have destroyed the patient. The disease appears to possess a very malignant nature.

#### CASE VIII.

A remarkable case of this kind occurred in St. Bartholomew's Hospital in 1797. A man between forty and fifty years of age had a large tumour at the side of his neck, beneath the platysma myoides. It measured about eight inches in length, and four in breadth. t was hard and irregular on the surface, seeming like a cluster of diseased lymphatic glands. It was extremely painful, and had greatly impaired his health. He affirmed that it had not been

* *Vide* Fasc. 5. Plate 2.

more than six months since its first appearance, and in the course of this time, numerous small tumours of similar density and structure had grown beneath the skin all over the trunk of the body, but chiefly on the neck and abdomen. The skin and the front of the tumour in the neck had ulcerated, and become a painful phagedenic sore; and the patient died with hectic fever, in about six weeks after his admission into the hospital. The structure of all the tumours was alike, and such as has been described: the body was examined by the students of the hospital, who said that there were no tubercles on the viscera, as there commonly are in cases of this disease.—As this disease is uncommon, it may not be improper to relate another case on which I was consulted in the course of the last year.

CASE IX.

A gentleman had a tumour in the lymphatic glands of the axilla, which he had taken notice of about a month, and which was supposed to be of a scrofulous nature. I was consulted as to the propriety of his going to the sea-side. The tumour was of the size of an egg, and its surface was irregular from the projection of numerous tubercles. This circumstance struck me, and led me to enquire if he had no other little tumours in the skin. He told me there was one in the groin, which appeared on examination to be a distinct tubercle; and on further enquiry, I found that the glands above the collar-bone, by the side of the neck, were in some degree affected. I had no doubt of the nature of the disease, and told the physician, that, in my opinion, it would terminate fatally.

After about a fortnight, when I saw the patient again, these tubercles had multiplied all over the skin, both in the front and back part of the body; they were hard and painful, and gave him the sensation as if he was lying on a number of hobnails. The disease in the glands, both below and above the collar-bone, had greatly increased, and the arm was very œdematous. The disease progressively increased; the skin seemed to peel off in thin sloughs from the surface of the enlarged glands in the axilla; but no sloughing or ulceration had taken place in the tumour when the patient died, which was about five weeks after I first saw him. On examining the body, the tubercles every where had the appearance which has been described; and many similar tubercles were found on the surface of the lungs, heart, liver, spleen, omentum, and mesentery. The absorbent glands of the mesentery, and the other internal absorbent glands were, however, unaffected.

Since the above account was written, I examined a body in which such tubercles were found very generally scattered beneath the skin. The patient was said to have died of a cancerous uterus, and the cervix was in a state of ulceration. The whole uterus was diseased, and the parietes were an inch in thickness. The disease, however, was not carcinomatous. From this case, as well as from others, which are related, it appears, that the same disorder of the general health may produce local diseases of a dissimilar appearance or nature.*

* Since the publication of the former edition, I have seen a case, which is to me so singular, that I wish briefly to mention it. A gentlemen had a spot in the skin, opposite to the inferior angle of the scapula. It had the appearance of one of those spots called petechiæ. It enlarged, thickened, and ul-

### *Pulpy or Medullary Sarcoma.*

The sarcoma which is next to be described is generally found in the testis, and is distinguished by the name of the soft cancer of that part. The term cancer is objectionable, because it conveys an erroneous idea of its nature, for this disease, though perhaps equally destructive, will be shown to be unlike cancer in its nature and progress.

The tumour, in those cases of the disease which I have most frequently met with, has been of a whitish colour, resembling, on a general and distant inspection, the appearance of the brain. The disease is usually of a pulpy consistence; and I have, therefore, been induced to distinguish it by the name of medullary sarcoma. Although I have more frequently met with this disease of a whitish colour, yet I have often seen it of a brownish red appearance. Which is most common I cannot decide: the structure and feel of both are the same, and their progress is also similar; they are there-

cerated. The ulcer became foul and intractable, and the patient came to London with his health much disordered, apparently from local irritation. The axillary glands became affected, and enlarged to a considerable size, and suppurated. Smaller spots resembling petechiæ came out in various parts of his body. He took medicines with a view to regulate and improve the functions of his digestive organs, which were much disordered. His general health improved, and under this change the original ulcer greatly amended in its appearance; the spots remained stationary; the parts in the axilla became so far sound, as to make it nearly certain that they had been affected only by common irritation, and not by a specific disease. This tranquil state lasted about six weeks, when the original ulcer became worse; and by the aggravation of that disease, without any increase of the others, his powers became exhausted, and he died.

fore to be considered as varieties of one species. The shortest way in which I can communicate a knowledge of this disease, and render those remarks which I have to make on it intelligible, will be, by relating a case in which it proceeded to a very considerable extent before it destroyed the patient.

CASE X.

A tall thin healthy-looking man, of about forty years of age, had, about fifteen years before, a swelled testicle from a gonorrhœa; the epididymis remained indurated. Six years afterwards it became enlarged, and a hydrocele at the same time formed. Half a pint of water was discharged by a puncture, but inflammation succeeded the operation, and this testis became very large. An abscess formed, and burst in the front of the scrotum, and the testis subsided in some degree. Mercury was employed to reduce it, but without effect. The part, however, was indolent, and gave the patient no trouble but from its bulk.

About a year afterwards a gland enlarged in the left groin (the same side as the testis): another then became swollen in the right groin, and, in the course of two years, several glands in each groin had obtained a very considerable magnitude. At this period he was admitted into St. Bartholomew's Hospital, under the care of Mr. Long. The testis was, at this time, between four and five inches in length, and about three in breadth; it resembled its natural form, and was indolent in its disposition. The spermatic chord was thickened, but not much indurated. Four or five glands were enlarged in the groin on both sides, each of which was of the size of a very large orange; and, when

observed together, they formed a tumour of very uncommon shape and magnitude.

They gradually increased in size for several months, till at last the skin appeared as if unable to contain them any longer. It became thin, inflamed, and ulcerated; first in the left groin, and exposed one of the most prominent tumours. The exposed tumour inflamed and sloughed progressively, till it entirely came away. As the sloughing exposed its vessels, which were large, they bled profusely, insomuch that the students endeavoured, but in vain, to secure them by ligatures: for the substance of the tumour was cut through, and torn away in the attempt. Pressure by the finger, continued for some time, was the only effectual mode of restraining this hemorrhage.

The loss of one gland relieved the distended skin, which had only ulcerated on the most prominent part of the tumour, and had not become diseased. It now lost its inflamed aspect; granulations formed, and a cicatrix took place. In the opposite groin a similar occurrence happened. One gland, exposed by the ulceration of the skin, sloughed out, being attended by the circumstances just recited. However before the skin was cicatrized, ulceration had again taken place in the right groin, in consequence of the great distention of the skin from the growth of the tumour; and sloughing had begun in the tumour, when the patient, whose vital powers had long been greatly exhausted, died.

The testis was injected, and, when divided, was found to be of a whitish colour, and moderately firm consistence, and was made red by the injection in various parts. The tumour formed by the inguinal glands on each side was as large as a man's head, and the structure was very similar to that of the testis, but more pulpy. On opening the body the

pelvis was almost filled with similarly diseased glands, and the vertebræ were hidden by others as high up as the diaphragm. The disease in the upper ones was not, however, so far advanced as in the others: some of the former, which lay close to the diaphragm, and were not larger than a walnut, being cut into, a thick fluid, resembling cream in colour and consistence, escaped, and was expressed, and the gland was left a contexture of loose fibrous substance.

The state of the glands newly affected shows, that the actions of this disease cause a secretion of fluid like cream; that this fluid acquires consistence during its residence in the part; and that it is the cause of the increase of size in the gland. The profuse hemorrhage, which took place during the sloughing, shows that there is an increase of vessels proportionate to the augmentation in bulk of the diseased part. The simple ulceration of the skin from distention, and the subsequent healing of the ulcer, show that this morbid affection is unlike carcinoma, which communicates its disease to all contiguous parts: neither has it the hardness nor the disposition to ulcerate, which characterize cancer. The general disease of the absorbing glands shows, that the diseased action is readily propagated in the course of those susceptible vessels; and the glands of the pelvis being affected equally with those higher up, renders it probable that it induces the disease, as well by imparting irritation to them, as by furnishing a matter capable of stimulating them when they have imbibed it; an opinion that will be more strikingly verified by the next case which I shall relate.*

* The progress of what is called the scirrhous testis, is similar to that of the disease which I am describing, and of

This species of sarcoma, though it usually affects the testis, occasionally occurs in other parts. I shall authenticate this fact by the brief relation of another case, which will serve also to throw additional light on the nature and progress of this disease.

CASE XI.

A boy, about twelve years of age, was brought to the Hospital for advice, on account of a tumour in the front of his thigh: it had been growing three or four months, and had then attained the size of a large orange. The base of it was situated close upon the bone. It increased, notwithstanding applications that were employed to disperse it, and the patient became confined to his bed. After some time the leg became œdematous to a very great degree; the inguinal glands were enlarged, but not in a degree proportionate to the œdema, none of them having attained to more than the size of a small walnut. The parts in the ham were also considerably swoln. In a short time the cause of the great degree of œdema was manifested; for the lower part of the abdomen became distended by a tumour, that seemed to rise out of the pelvis and compress the iliac vessels. The boy's health, as may be supposed, gradually declined; and, when the disease had attained to this state, he died.

On examining the parts it was found, that the tumour, though it lay close to the periosteum

course very different from that of genuine carcinoma. It is not improbable, that from the similarity of the progress of these two diseases, and the equal fatality having been remarked, they first acquired the contrasted names of soft and hard cancers of the testis.

of the thigh bone, had no connection with it; that it was in structure like the disease last described; and that the disease had extended, through the medium, and in the course of the absorbing vessels, downwards to the ham, where the glands were enlarged and formed a considerable tumour; and upwards into the pelvis, where the internal iliac glands more than filled one side of that cavity, rising out of it, as has been said, so as to distend the lower part of the abdomen. The disease had also extended so as slightly to affect the lumbar glands. The tumours in the ham and pelvis were of the same structure as the original tumour. The inguinal glands, though affected apparently by the same disease, were not considerably enlarged.

This case also shows the uncommon facility with which this disease is propagated along the absorbing vessels; and its having extended downwards to the ham, as well as upwards into the pelvis, confirms the opinion, that it extends itself by imparting irritation to the vessels, as well as, perhaps, by furnishing a matter which, if imbibed, may communicate the same irritation.

I have mentioned, as a variety of this disease, that in which the colour is different, it being between a brown and that of the blood; but in texture and organization it does not appear dissimilar. It seems therefore as if the diseased action caused the secretion of a fluid, sometimes of a milky, sometimes of a more dusky hue; which gradually acquires solidity, and augments the bulk of the part. The diseased part acquires in general a considerable solidity when it has continued for some time, so as scarcely to deserve the names of soft cancer, or medullary sarcoma. The hardness is also, in some instances which I have seen, increas-

ed, apparently by a thickening of the cellular substance which pervades the gland.

It seems probable, however, that the same kind of diseased action may not be always followed by the like alteration of structure, in the part which it affects. Mr. Astley Cooper, in his Paper on Obstructions of the Thoracic Duct, mentions an instance in which matter imbibed from a testis affected with a disease like the present, obstructed that vessel. His description of the testis is, that it was "a pulpy mass, composed of broken coagulable lymph, and blood-coloured serum."*

I remember one instance of the inguinal and lumbar glands being affected with a disease similar to those just described, from a diseased testis of a different structure. The testis was removed in the Hospital, and was found much enlarged, and vascular throughout, except where some soft cheese-like matter was deposited. Some of the inguinal glands enlarged, ulcerated, and sloughed out, and the wound seemed disposed to heal. The lumbar glands were affected, became extremely painful, and the patient being previously much exhausted, sunk under this last complaint.

He had been removed to some distance from the Hospital, and I could not obtain permission to examine the body till four days after his decease. I took out the lumbar glands and put them in water; and, the weather being extremely hot, when I examined them the next day, I found that all the unorganized deposited matter which had enlarged them, had become putrid, and was washed away, leaving the capsule of the gland, and a congeries of flocculent fibres occupying the interior part of it: these were doubtless the vessels and connecting cellular sub-

* *Vide* Medical Records and Researches, p. 96.

stance of the glands, not indurated (as I have seen it in some other instances) by inflammation.

In the advanced stage of this disease, sometimes lymphatic glands out of the course of absorption, and of the participation of irritation, become affected with the same disease; and a secretion of this thick cream or bloody-coloured fluid takes place on the surface, or in portions, even in the liver or lungs, or other viscera. I have heard this circumstance accounted for, by supposing that the absorption of the matter deposited in the originally diseased parts was so abundant as to induce the necessity of depositing it in various places; but it seems to me more rational to attribute it to the prevalence of the same diseased disposition throughout the body. For we frequently find, that solid tumours of similar structure exist in various parts of the same subject; and sometimes they rapidly multiply as the disease advances; as was mentioned in the case which is related of tuberculated sarcoma.

### *Carcinomatous Sarcoma.*

The last species of sarcomatous tumour which I have to describe, is the Carcinomatous. It is not here designed to give a full or distinct history of Carcinoma, but only a general and comparative account of those circumstances in which it resembles or differs from other tumours. This kind of tumour, on account of its peculiar hardness, is emphatically termed Scirrhus, while it remains entire and free from ulceration. But the word scirrhus is frequently applied to other indurations, and it seems better, in order to avoid ambiguity, to use the same term to denote all the stages of this disease, naming it carcinoma, in the first place, and ulce-

rated carcinoma when that change has occurred. This disease is not, in every instance, so peculiarly hard as to entitle it to the name scirrhus; and however indurated it may be, it still must be accounted a kind of fleshy tumour; therefore I may be allowed to call it carcinomatous sarcoma.

I shall arrange the observations which I have to offer under three heads: 1st, The history of carcinoma. 2dly, Its anatomical structure; and, 3dly, I shall compare this disease with others which resemble it. I shall suppose the carcinoma to arise in the female breast, as there it most frequently occurs, and can be best investigated.

It sometimes condenses the surrounding substance so as to acquire a capsule; and then it appears, like other sarcomatous tumours, to be a part of new formation: in other cases the mammary gland seems to be the nidus for this diseased action. The boundaries of the disease cannot be accurately ascertained in the latter case, as the carcinomatous structure, having no distinguishable investment, is confused with the rest of the gland. In either instance carcinoma begins in a small spot, and extends in its progress from thence in all directions, like rays from a centre. This observation will serve to distinguish it from many other diseases which, at their first attack, involve a considerable portion, if not the whole of the part, where they occur. The progress of carcinoma is more or less quick in different instances. When slow, it is in general unremitting; at least I am inclined to think that the disease, though it may be checked, cannot be made to recede by that medical treatment which lessens the bulk of other sarcomatous tumours. This circumstance affords, in my opinion, another criterion, by which it may in general be distinguished. This obdurate and destructive dis-

case excites the contiguous parts, whatever their nature may be, to the same diseased action. The skin, the cellular substance of muscles, and the periosteum of bones, all become affected, if they are in the vicinity of cancer. This very striking circumstance in the history of carcinoma distinguishes it from most of the diseases already described. In the pulpy sarcoma the disease is propagated along the absorbing system, but the parts immediately in contact with the enlarged glands do not assume the same diseased actions. Neither in the tuberculated species does the ulceration spread along the skin, but destroys that part only where it covers the diseased glands.

It was observed by Mr. Hunter that a disposition to cancer exists in the surrounding parts, prior to the actual occurrence of the diseased action. This remark, which is verified by daily experience, led to the following rule in practice: "That a surgeon ought not to be contented with removing merely the indurated or actually diseased part, but that he should also take away some portion of the surrounding substance, in which a diseased disposition may probably have been excited." In consequence of this communication of disease to the contiguous parts, the skin soon becomes indurated, and attached to a carcinomatous tumour, which in like manner becomes fixed to the muscles, or other parts over which it was formed.

As a carcinomatous tumour increases, it generally, though not constantly, becomes unequal upon its surface, so that this inequality has been considered as characteristic of the disease; and it is a circumstance which deserves much attention. A lancinating pain in the part frequently accompanies its growth; but in some cases this pain is wanting. It attends also on other tumours, the structure of

which is unlike carcinoma; of which I have given an instance in speaking of pancreatic sarcoma. This cannot therefore be considered as an infallible criterion of the nature of the disease.

In that kind of cancer, from which this description is taken, the diseased skin covering a carcinomatous tumour generally ulcerates, before the tumour has attained any great magnitude; a large chasm is then produced in its substance by a partly sloughing, and partly ulcerating process. Sometimes, when cells contained in the tumour are by this means laid open, their contents (which consist of a pulpy matter of different degrees of consistence, and various colours) fall out, and an excoriating ichor distils from their sides. This discharge takes place with a celerity, which would almost induce a person ignorant of the facility with which secretion is performed, to believe that it cannot be produced by that process.

When the diseased actions have, as it were, exhausted themselves by their vehemence, an attempt at reparation appears to take place, similar to that which occurs in healthy parts. New flesh is formed, constituting a fungus of peculiar hardness, as it partakes of the diseased actions by which it was produced. This diseased fungus occasionally even cicatrizes. But though the actions of the disease are thus mitigated, though they may be for some time indolent and stationary, they never cease, nor does the part ever become healthy.

In the mean while, the disease extends through the medium of the absorbing vessels, and the glands in the axilla become affected. The progress of carcinoma in an absorbent gland is the same as that which has been already described. The disease is communicated from one gland to another, so that after all the axillary glands are affected, those that

lie under the collar-bone at the lower part of the neck, and upper part of the chest, become disordered. Occasionally a gland or two become diseased higher up in the neck, and apparently out of the course which the absorbed fluids would take. The absorbent glands, in the course of the internal mammary vessels, become affected as the disease continues. In the advanced stage of carcinoma a number of small tumours, of similar structure to the original disease, form at some distance, so as to make a kind of irregular circle round it.

Here it is no wonder that I conclude the account of the dreadful effects of this pernicious disease. For when it has done so much mischief, the strongest constitutions sink under the pain and irritation which the disease creates, aggravated by the obstruction which it occasions to the functions of absorption in those parts, the vessels of which lead to the diseased glands. Towards the conclusion of the disease the patient is generally affected with difficulty of breathing and a cough. In cases where the external disease has been removed, the same symptoms of disordered respiration take place, and the patients die of internal diseases.

It has been a subject of debate and consideration, whether the disease of the absorbent glands, which takes place in carcinoma, be the effect of the stimulus of matter imbibed by those vessels from the original disease, or of irritation propagated along them. The reason for supposing that no poison is imbibed is, that if it were conveyed into the blood, it would produce general disease in the constitution; but no more fever or general disorder is found to exist in carcinoma than what would naturally be produced by the irritation which the affected parts occasion. It does not seem essential to my present design to discuss this subject at length: it is

however right to observe, that we scarcely ever see glands diseased out of the course which the absorbed matter would naturally take, though they are affected in this manner in diseases which can be propagated by irritation. When the glands of the axilla are obstructed by disease, the absorbed matter will pass by anastomosing channels, into the internal mammary absorbents, and if occasionally one or two glands in the neck are found diseased, they may become affected in the same manner, by the fluids being obliged to take a circuitous route.*

There is another circumstance in the history of cancer which deserves attention and investigation; that is, Whether a disease not originally cancerous can become so in its progress? We can only form our opinions on this subject from analogy and observation. Analogy leads us to believe, that such an alteration in the diseased actions may readily take place. Venereal buboes often change their nature after the administration of mercury, and become troublesome sores, to which that medicine is rather detrimental than beneficial. Injuries induce inflammation and enlargement of parts, which afterwards degenerate into scrofulous diseases. But, though analogy seems so strongly to favour the opinion, I cannot take upon myself to say, that my observations have confirmed it. When tumours have been removed, the history of which corresponded to that of cancer, a cancerous structure was observed in them; and, on the contrary, in diseases of an apparently different nature, a different organization has been found. I once, indeed, assisted at an operation

* It may be proper to enquire, whether those tumours, which arise in the circumference of carcinoma, are not caused by the absorbent matter being made to stop for a time in the vessels, and thus to afford that irritation which induces disease in them and the contiguous parts?

where the tumour was of that kind which I have denominated pancreatic; and I heard afterwards, that the patient died in the country of a disease which was reputed cancerous. Again, in investigating this subject, it deserves to be remarked, and every surgeon must, I believe, be familiarly acquainted with this fact, that many diseased tumours remain in the breast for a great length of time, perhaps during life, without undergoing any change in their nature; or, in other words, without becoming cancerous.

It is difficult to convey correct ideas of the structure of carcinoma by words, or even by drawings. In the generality of instances the diseased part is peculiarly hard, and there are intermixed with it firm whitish bands, such as Dr. Baillie has described and represented in his Book and Plates of Morbid Anatomy. There is indeed no other striking circumstance, which can be mentioned as constantly claiming attention in the structure of this disease. These firm whitish bands sometimes extend in all directions from the middle towards the circumference of a carcinomatous tumour, like rays from a centre, having little intervening matter. Sometimes they intersect it irregularly; having interposed between them a firm brownish substance, which may be scraped out with the finger. Sometimes they form cells containing a pulpy matter of various colours and consistence; and sometimes these bands assume an arborescent arrangement, ramifying through the diseased substance.

Firm white bands, like thickened and compact cellular substance, are seen as the disease advances, to extend themselves from the original tumour amidst the fat in which it is occasionally imbedded, intercepting portions of fat in the irregular areolæ which they form. This circumstance deserves con-

sideration on account of its practical application; for if, after removing a carcinomatous tumour, the surgeon attends to the part which has been taken away, he will see if any of these bands have been cut through, and, consequently, whether some of this diseased substance, which ought to be removed, has not been accidentally left. This circumstance cannot be observed by looking at the bleeding surface of the wound, but may be readily ascertained by examining the part which has been removed.

These are the chief circumstances, which I think sufficiently characterize carcinoma, and distinguish it from other sarcomatous tumours. The account of them is brief, and much has been omitted, because it was not designed particularly to discuss the subject of carcinoma, but merely to point out its distinguishing characters. I now proceed to speak of diseases resembling cancer; though, in so doing, I shall digress a little from the principal subject of this paper, that is, to describe the distinguishable kinds of sarcomatous tumours, and give their history.

According to the preceding account, carcinoma begins in a small scirrhus, which gradually enlarges and afterwards ulcerates. It does so in the breast, lip, tongue, and cervix uteri; yet it may be enquired if it does so in every instance. Parts sometimes superficially ulcerate at first, and afterwards acquire surrounding hardness, and strikingly resemble carcinoma, if they do not strictly deserve that name. This is the way in which some of those diseases proceed, which occur near the side of the nose or eye, and which gradually destroy the parts in which they are situated, and cannot be cured by any mode of local or general treatment. The intelligent reader will not suspect me of confounding

these more malignant diseases with some herpetic ulcerations of the nose, in which the morbid actions gradually cease, and the first affected parts get well whilst the surrounding parts become diseased. I have known diseases beginning in ulceration and followed by induration, and the growth of fungus, extend themselves unremittingly, so as to destroy the patient. I have seen diseases of this description occur in the labia pudendi, some of which have terminated fatally, whilst others were removed even at an advanced period of the disease with success.

Here some additional discriminating circumstances seem to be wanted, by which we may distinguish between these ulcers and common carcinoma. I have never remarked, that such ulcers have affected the absorbent glands, though I do not feel assured that this occurrence never takes place. It therefore remains to be determined by future cases, how far this circumstance may enable us to decide on the nature of these diseases. I shall next relate the principal circumstances of a remarkable case of this kind of disease, which will serve to elucidate the subject, and also to exhibit a specimen of the diseases to which I allude.

### CASE XII.

A man was admitted into St. Bartholomew's Hospital with a tumour beneath the jaw, having a great degree of surrounding hardness, and containing three cells, like those of carcinomatous tumours. The history which he gave of the disease was very curious: he said that a redness took place superficially in the skin, which gathered and burst, and discharged good matter; that the opening en-

larged, and the surrounding parts indurated, and thus produced an appearance like a cell in a carcinomatous tumour; then, another portion of skin became diseased in the same manner, and with the same consequences, till, by degrees, the general tumour had acquired its present magnitude. To the truth of this account we had an opportunity of bearing testimony; for this occurrence took place twice in succession during his residence in the Hospital; and thus two more cells were added to the general mass. The inflammation of the skin, and the suppuration, which was healthy in appearance, took place beneath the tumour, and made it reach almost as low as the sternum. As the patient's health had considerably declined by the irritation of the constitution which this disease kept up, and as no amendment of the disease had taken place in consequence of the applications or medicines which were employed, he left the Hospital, and went into the country.

Diseases also, which strikingly resemble carcinoma in appearance, form in the following manner. An enlarged lymphatic gland shall gradually become soft, and contain a fluid. In this state it ulcerates or is opened; but instead of subsiding, it inflames; the surrounding parts become indurated; the integuments acquire a dusky hue; the opening and cavity enlarge, and assume the appearance of a cyst, from the sides of which fungus arises, and turns over the everted edges of the opening. I have also seen, after the bursting of an encysted tumour, the surrounding parts indurate, and throw out a fungus, forming a disease appearing like cancer, and which could not be cured.

Are such diseases as I have here described to be accounted carcinomatous? If not, What are the characters which discriminate between them and

carcinoma? As I have no precise or satisfactory information to communicate, I forbear to say any thing on the subject.*

Since the first edition of these observations, several publications have appeared on the subject of cancer, and as there are many circumstances relating to its history, upon the determination of which, by general observation and experience, our practical rules of conduct must be founded, I take this opportunity of presenting to the public some additional observations with respect to it, without presuming to comment on the opinions of others. I shall also in this account confine myself to the disease, as it appears in the female breast.

The account of carcinoma that I have already given, is taken from the most strongly characterized specimen of the disease occurring in that part, which is peculiarly hard, and rarely attains considerable magnitude. There are, however, varieties; and one of the most remarkable is, that of the disease attaining a very considerable size before it ulcerates. In this case sometimes the integuments remain pale and pliant, and a surgeon who first sees the breast in this state, may doubt whether

* A patient was admitted into St. Bartholomew's Hospital, with several indurated, foul, but small sores, about the bend of the elbow, and some which intervened between it and the axilla. The axillary glands were much diseased, and the arm was swollen and hard. She said that the sores began like common gatherings, and that they hardened after the skin had given way. That the disease began in superficial sores, and that the axillary glands were next affected.

The patient died in the Hospital; and, on examining the limb, a great number of tubercles were found in it, several of which were imbedded in the nerves of the arm. The lungs also contained a great number of tubercles which appeared to be the effect of the same kind of disease affecting that part.

the disease be actual cancer or common sarcoma. The substance of the tumour is also much less hard than in the specimen first described; yet it is more compact and weighty than most other diseases of the same bulk which are not carcinomatous. If at first a surgeon may hesitate to decide upon the nature of this disease, his opinion will in general be speedily determined by enquiry and examination. If the history of the disease accords with that of carcinoma; that is to say, if it began in a small district, and regularly and unabatingly attained its present magnitude; if the surface of the tumour be unequal, having in various parts produced roundish projecting nodules, the disease will almost invariably be found to be carcinoma. The skin will soon adhere to one or more of these prominences; it will ulcerate and expose the subjacent parts, and the future progress of the disease will so exactly accord to that of the harder and smaller specimen which I have described, as not to require a separate description. In general, however, the absorbents are much less liable to become affected in the latter variety of this disease.

Having thus represented the extreme varieties of carcinomatous diseases, I need scarcely observe, that there will be intermediate degrees. In carcinoma, as in other diseases, it appears to me, that the history and progress is more declarative of its nature than any circumstance which we may be able to discover by the sight or touch.

There is one circumstance in the history of carcinoma which may prove very perplexing to the observer, and tend to induce him to disbelieve that there is any regular progress belonging to this disease. I allude to the occurrence of cancer in parts previously diseased in another manner. Analogy, as I have said, would induce us to believe, tha

this might be a frequent occurrence; yet I cannot say that my observations have led me to think, that it very commonly takes place. Cases of tumours, which have remained indolent for twenty or more years, becoming cancerous at an advanced period of life, are not unfrequently met with; and when tumours form in or about the breast at an advanced period of life, though the progress at the beginning may assure us that they are not carcinomatous, yet they may become so, after the lapse of but a few years, or even a shorter period of time. The impression which the consideration of such circumstances has left on my mind (in conjunction with the information which I think I possess relative to the general health of a patient liable to cancer, and which I will presently communicate,) is, that the patients who are subject to such an occurrence, might have been liable to the formation of a cancerous disease at the same period, even if no diseased structure had previously existed, and formed a nidus for the cancerous actions. That they are more likely to begin in parts previously diseased, I readily admit; and that it may be prudent and proper to remove such diseases as I now allude to, under the circumstances which I have mentioned, and shall still further describe, is an opinion in which I readily concur; yet, if an idea, that most or many diseased structures might become cancerous was generally prevalent, it would doubtless lead to the performance of many unnecessary operations.

In the first volume of these Observations, I have given an opinion, which I am inclined even more fully and strongly to repeat, that a great number of tumours in and about the female mamma arise from a disordered state of the health in general, and consequently that the most judicious and

effectual mode of dispersing them, is by correcting that general disorder. Such cases are very numerous, and very important, as the reader may see, by referring to the few that I have printed; yet all, or most of these, would be consigned to removal by the knife, were the idea which I have mentioned to become prevalent. When, however, a tumour that cannot be dispersed by the means to which I now refer exists in or about the breast, and which we feel assured is not of a carcinomatous nature, it may be well to remove it, because it is often a constant source of disturbance and alarm to the patient's mind; and, I am ready to admit, that it is likely to be a nidus in which cancerous actions may be engendered in a constitution predisposed to that disease. However I feel myself fully warranted in asserting, from my own experience, that many of them will remain in the same state for a great length of time, and even through life, without becoming cancerous.

That cancer, like most other local diseases, owes its origin to a disordered state of the health in general, is an opinion which I do not expect to be controverted. We express it even by saying, that there is a preposition to cancer. Mr. Hunter was of opinion, that cancer was so far local, that if all the diseased part, or that which was so contiguous to it, as to have felt its influence, and to have acquired a predisposition to disease, were removed, the patient would be as exempt from cancer in that part as if it never had occurred. This opinion, deduced from his own experience, is very important; it shows us how we ought to operate when an operation is to be undertaken. I am ready to admit the truth of this opinion to the extent affirmed by Mr. Hunter; but though the patient may be as exempt from the disease as if it never had occurred,

that state of constitution which induced it originally, may after a certain lapse of time cause it to form again,* or may produce the same disease in other parts of the body, or a patient may die of other ills or diseases attendant on a cancerous constitution.

In our present state of knowledge, we are not, I believe, able to distinguish any peculiar circumstance as characteristic of a cancerous constitution. We observe in it those circumstances which indicate a disordered constitution, and augment the disorder by each reciprocally aggravating the other; I mean irritation, weakness, or some undefinable disorder of the nervous functions; and such disorder in the functions of the digestive organs, as I have described in the first volume of these Observations. I see persons having the same evident affection of the health in general, subject to tumours in and about the breast, which are not cancerous, and to those which are cancerous. What additional circumstances lead to the establishment of cancerous actions in the local disease thus induced, we have yet to learn.

Previously to the occurrence of cancer the nervous disorder, and that of the digestive organs, have, in general, been greater in degree, and longer in duration, than they are found to be antecedently to other disorders. Some patients having cancer die of organic diseases in the head or abdomen. If

* If after the removal of cancer, when the operation has been properly performed, the cicatrix remains healthy for five or six years, or even for a shorter period, and then becomes indurated and carcinomatous; it appears to me more consistent with what we know of the action of this disease, to suppose, that it has originated again in consequence of the diseased propensities of the constitution, rather than that it has lain dormant so long, and is but now awakened.

the nervous and visceral disorders are active and considerable, the progress of the local disease will be, in general, proportionately rapid and destructive; and if, on the contrary, these disorders are mild, and less in degree, the progress of the local disease will be proportionally slow and gentle. In confirmation of these observations, I may mention, that I have seen several instances of cancer proceeding so mildly, that the patients have lived many years with little suffering or inconvenience from the local disease, and particularly where attention has been paid to regulate the functions of the digestive organs.*

* There can be no subject which I think more likely to interest the mind of a surgeon, than that of an endeavour to amend and alter the state of a cancerous constitution. The best timed and best conducted operation brings with it nothing but disgrace, if the diseased propensities of the constitution are active and powerful. It is after an operation that, in my opinion, we are most particularly incited to regulate the constitution, lest the disease should be revived or renewed by its disturbance. In addition to that attention to tranquillize and invigorate the nervous system, and keep the digestive organs in as healthy a state as possible, which I have recommended in the first volume, I believe general experience sanctions the recommendation of a mere vegetable, because less stimulating diet, with the addition of so much milk, broth, and eggs, as seem necessary to prevent any declension of the patient's strength.

Very recently, Dr. Lambe has proposed a method of treating cancerous diseases, which is wholly dietetic. He recommends the adoption of a strict vegetable regimen, to avoid the use of fermented liquors, and to substitute water, purified by distillation, in the place of common water used as a beverage, and in all articles of diet in which common water is used, as tea, soups, &c. The grounds upon which he founds his opinion of the propriety of this advice, and the prospect of benefit which it holds out, may be seen in his "Reports on Cancers," to which I refer my readers.

My own experience on the effects of this regimen is of course very limited, nor does it authorise me to speak deci-

With a view to impress the contrary fact on the mind of the reader, I will briefly relate two cases in proof of it.

CASE XIII.

A lady came from the country with a cancerous tumour in the breast, and took some medicine, probably arsenic, by the desire of a female quack, which brought on the most violent sickness and purging, with death-like faintings. It was uncer-

dedly on the subject. But I think it right to observe, that in one case of carcinomatous ulceration in which it was used, the symptoms of the disease were, in my opinion, rendered more mild, the erysipelatous inflammation, surrounding the ulcer, was removed, and the life of the patient was, in my judgment, considerably prolonged. The more minute details of the facts constitute the sixth case of Dr. Lambe's "Reports."

It seems to me very proper and desirable, that the powers of the regimen recommended by Dr. Lambe, should be fairly tried, for the following reasons:

1st. Because I know some persons who, whilst confined to such diet, have enjoyed very good health; and I have further known several persons who did try the effects of such a regimen, declare, that it was productive of considerable benefit. They were not indeed affected with cancer, but they were induced to adopt a change of diet to allay a state of nervous irritation, and correct disorders of the digestive organs, upon which medicine had but little influence.

2dly. Because it appears certain, that in general the body can be perfectly nourished by vegetables.

3dly. It seems sufficiently ascertained, that diseases have in some persons been excited by water, and therefore it is desirable, that whatever is used should be made as pure as possible.

4thly. Because all great changes of constitution are more likely to be effected, by alterations of diet and modes of life, than by medicine.

5thly. Because it holds out a source of hope and consolation to the patient, in a disease where medicine is known to be unavailing, and surgery affords no more than a temporary relief.

tain for several days whether she would survive its effects. Inflammation was induced in the local disease to such a degree, that the cancer sloughed, and came out, and violent erysipelatous inflammation extended itself from the skin of the breast to a great extent. The sides of the cavity, however, threw forth a cancerous fungus, and in this state she returned into the country.

### CASE XIV.

A lady about forty-six years of age, asked my opinion respecting a small lump in her breast. She was very nervous and agitated, and her bowels extremely disordered. She said she had sometimes twenty discharges from her bowels in twenty-four hours; and that the secretion of bile was as faulty as possible. After about six weeks she called upon me again, having been in the country: the medicines which she had tried had been productive of little or no good. Her conversation was equally desultory and agitated. Her pulse very frequent. The lump was enlarged to about the size of a walnut, but had no signs by which I should have known it to be cancer. Hearing that her surgeon in the country thought it cancerous, and believing that an operation in her present state was inadmissible, I recommended her to take the opinion of another surgeon. I did not now see her for some time, I believe about two months, when the tumour had become as large as an orange, and had thrown out a fungus, which protruded in nodules. The tumour had, she told me, become soft, and seemed as if it were gathering; and these protrusions took place afterwards. Her general health was still equally disordered, and the surgeon, who had seen her, concurred with

me in opinion, that an operation under her present circumstances was inadmissible. The lump rapidly increased; and, in the course of a few months, became as large as a child's head, having all the characters of carcinoma. It then ulcerated, and did not afterwards materially enlarge. I need not describe how it ulcerated, and how it, occasionally, bled profusely. She gradually became emaciated and feeble, and died exhausted, without the glands in the axilla becoming diseased, or any peculiar symptoms occurring.

In order further to elucidate the opinions which I entertain respecting the constitutional nature of cancerous disease, I select the following case.

### CASE XV.

A lady had had a tumour in, or near the right breast, for more than twenty years, which, when she was between fifty and sixty years, may be said to have become cancerous. The patient indeed insisted, that the cancer did not begin in the original lump, but by the side of it. No local treatment arrested its progress; and, in a short time, it became cognizable from its induration and irregularity of surface, as a decided case of cancer. The tumour, and a considerable portion of the surrounding parts, were therefore removed. The wound healed healthily in a short space of time, and the patient left London. She had always been, to use her own expression, extremely bilious, yet the discharges from the bowels were but rarely tinctured with good bile. She had passed gall stones. Her bowels were very irregular in their functions, being frequently very costive, or the reverse. Whilst I had attended her, she had taken five grains of the

compound calomel pill every second or third night, and kept the bowels as regular as possible. She said, that her health had been greatly benefited by these attentions, and I urged her still to continue them. For a year or more, after she left London, she was well, the cicatrix remaining perfectly soft and smooth. Having occasion to travel after that period during the winter, and being badly accommodated at the inns she met with on the road, she caught cold, and became very feverish and unwell. The cold, she said, had fixed itself on the lungs, for a cough, and a difficulty of breathing continued, and increased, so that in a little more than a year from its commencement it destroyed her. About six weeks before her death, she came to London, when she told me, that since the time of her catching her dreadful cold she had found a lump begin to form in her other breast, and that the cicatrix had afterwards become diseased. The tumour in the left breast was of a globular form, of about an inch and a half in diameter; it was hard, weighty, and nodulated upon its surface. It was most characteristically cancerous, but what I should term a dwarf or stunted specimen of that disease, such as we see produced when the powers of the constitution are much lessened. This, and the correspondent fact of cancer diminishing when the powers of constitution decline, should be noted, or else a surgeon might attribute such effects, the consequences of natural causes, to the medicine which he employs. The upper part of the cicatrix, on the opposite side, had indurated and ulcerated, but not to a considerable degree. I was not permitted to examine the body, which I much wished to have done, because, I believe, the extreme difficulty of breathing could not have been occasioned by any thing less than organic disease of the lungs.

I have, however, examined the bodies of cancerous patients who died with difficulty of breathing, without discovering disease in those organs.

The symptoms subsequent to operations, being the result of that excitement of constitution which the thoughts and injury of the operation occasion, often exhibit, in a very striking manner, the diseased propensities of the constitution. I think it may be useful briefly to relate those which occurred after the removal of a cancerous tumour in a case which I lately attended. The patient possessed what might, in general, be called a good constitution, and great fortitude, so that she bore the operation without the least complaint. Yet during the day preceding the operation, she had a slight lumbago, as she called it, which I believed to be the effect of that anxiety of mind which the thoughts of undergoing the operation must occasion. In the evening after the tumour had been removed, she complained of a desire, and of an inability to void urine; she had also sensations in the throat like hysterics. Her pulse was 80. She had no sleep during the night, but had voided half a pint of urine, which had no striking peculiarity of appearance. Saline draughts had hitherto been given, and she was now desired to take ʒj of ol. ricini, mixed with mucilage and cinnamon water, every fourth hour till a stool was procured. She took seven draughts without any effect. The pain in the back increased, and during the second night was so severe, that she groaned very constantly from the pain. On the third morning, I found her very ill, yet her pulse was not more than 90, neither was her skin hot. She had voided no urine for the last thirty hours; pain continued from the back down the thighs, but the absence of fever convinced me, that the pain in the back and suppression of urine could not be the effect of nephritis. Thinking, as I had done from the

beginning, that the kidneys were sympathetically affected by the state of the bowels, and that the pain of the back depended on the state of those organs, I now ordered her a pill of extract of colocynth, and a draught of Epsom salts, every fourth hour, instead of the castor oil. In the evening discharges from the bowels took place; she had five stools, and the pain in the back had nearly ceased. Feeling very languid, and having had no sleep during the two preceding nights, she took twenty drops of laudanum, and a little nitrous æther, in water. This medicine produced great heat and uneasiness in the stomach; and though she slept a little from the opium, her sleep seemed to be attended with more disturbance than benefit. She voided some urine during the night, which was like extremely muddy water. As the discharges from the bowels had ceased, and did not seem likely to be renewed, she began again with the castor oil draughts, by which an evacuation of the bowels was procured in the course of the day. The urinary secretion continued, and was augmented in quantity. As the stools were not properly tinctured with bile, three grains of the pilul. hydrarg. were ordered to be given every second night for the future. Dyspeptic symptoms and flatulence now claimed our chief attention. She complained of great acidity, of distention, and tenderness at the lower part of the epigastric region. For this she took chalk mixture, with aromatic confection, and afterwards magnesia; which latter medicine seemed afterwards sufficient to keep the bowels in a gently lax state. In about a fortnight her bowels were in a comfortable state, and in about three weeks the urine was clear, and secreted in the usual quantity. On the eighth day, when the dyspeptic symptoms were severe, the

patient had gout in her finger and toe, to which she had been previously subject. It is right to mention, that prior to the operation, the urinary secretion had never appeared to her to be irregular either in quantity or quality, and that her bowels had been readily affected by rather slight doses of medicine. The same circumstances were observed after the subsidence of the disorder occasioned by the operation. I have satisfaction in adding, that though the wound suffered during the continuance of the constitutional disturbance, it afterwards healed rapidly and smoothly, so that at the end of six weeks, it had the appearance of of a scar in perfectly healthy parts.

If cancer be a constitutional disease; if patients affected with it have occasionally other diseases of a fatal nature; if in some instances, when there is no organic disease, the nervous system is so irritable, and the digestive organs so disordered, as to render any operation perilous; these circumstances must render every surgeon who perceives them reluctant to operate, and uncertain as to the event of the case. They show the necessity of solicitously attending to the constitution of the patient after an operation, with a view to prevent the recurrence of the disease, or its formation in other parts. They explain how it happens, that the operation frequently accelerates the death of the patient. I have known a patient die soon after an operation for the removal of a cancerous tumour of no great magnitude, merely in consequence of the shock imparted to the constitution by the operation. I have known other cases, in which the diseased state of the wounded parts seemed to have been the chief cause of the speedy death of the patient. I therefore concur in opinion with those surgeons, who think, that in many instances an operation for the

removal of cancer would be rash and unjustifiable. Yet, however numerous and momentous the deterring reasons may be, I think they should not prevent our operating in many cases. If the whole of these diseased parts, and those which, from contiguity with them, may have been so far influenced as to acquire a disposition to disease, can be removed, it surely ought to be attempted, provided the constitution is not so disordered, or diseased, as to prohibit the operation. We ought to bend our minds attentively to make out the characteristic signs of cancer, that we may know it at an early period, and when the disease is in a small compass, and the operation on that account less formidable. To forbear to operate is to consign the patient to hopeless misery.

Fumigations with carbonic acid gas, weak acids, and fresh vegetable juices, correct the fœtor, infusions of opium lessen the pain, and oxyds and saline preparations of iron seem to expedite the destruction of the diseased parts, and cleanse the sore; yet I have not seen any such effects from local applications as leads me even to hope that any may be discovered that will cure the local disease.

The ulceration and self-destroying process of cancer is so horrible a process, that it may be stated as an argument for the operation, that a patient gets rid of a quantity of disease upon easier terms by having it removed by the knife, than by suffering it to proceed in its natural course. When the scar or surface of a wound after an operation, becomes indurated and cancerous, the patient suffers much less pain, and there is much less fœtor in the disease thus formed, so that the patient's sufferings are, on the whole, much diminished. But if the patient's constitution be moderately

good, and if the operation be performed at a sufficiently early period, I have known life prolonged for five, six, or more years; and when, after that lapse of time, the cicatrix has become diseased, the actions which ensued have been indolent, and the patients have gradually sunk and died, rather from some circumstances connected with the state of the general health, than from the degree of the local disease.

There are tumours, the structure of which may not correspond with any of the descriptions that I have given. I feel, however, unable, from my own observations, to depict any other species. It seems to me, that these diseases resemble colours in this respect, that a few of the primary ones only can be discriminated and expressed, whilst the intermediate shades, though distinguishable, by close attention and comparative observation, do not admit of description or denomination. There are single tumours, in the composition of which several of the above-described structures may be found, and, perhaps, some part of which may not correspond to any description that has been given. If, however, the history of these dissimilar diseases which appear in the form of tumours, were accurately recorded, and their structure noted, we might perhaps from the former be led to judge of the latter; and thus attain a knowledge of the intrinsic nature of the disease which would enable us to act rightly in practice.

### *Encysted Tumours.*

In the class of local diseases, and in the order of tumours, custom seems to have placed the genus of Encysted Tumours, next to those of the

sarcomatous kind. The arrangement indeed appears proper; for they are so allied in appearance and in the sensation which they impart on examination, that they are not unfrequently mistaken for each other; and yet, in general, the encysted tumours have sufficiently distinguishing characters to enable a surgeon to determine their nature prior to the performance of an operation. The discriminating characters are, a regularity of surface and shape, and a pulpy feel. Yet most surgeons will, I believe, acknowledge, that they have seen tumours dispersed, which they have taken for wens; and have even, when they have removed them under that belief, discovered the disease to have been a soft regularly shaped sarcoma, and not a cyst containing a pulpy substance.

Respecting the structure of encysted tumours I have nothing to remark, but what is, I believe, generally known. The cysts most frequently are composed of many lamellæ, which are sometimes so compacted, as to be scarcely distinguishable. These cysts vary considerably in thickness; being sometimes very thick and tough, and at others extremely thin and tender. They sometimes most tenaciously adhere to the contiguous parts, so as to make it difficult to separate them; and, at others, they are so loosely connected, that, when an incision is made which lays bare the cyst, the whole tumour starts out without any dissection.

That the interior surface secretes the contents formed in the cyst, is in my opinion indisputable. Tha it is a secreting surface I believe; because, when a wen has spontaneously opened by ulceration, I have seen the cyst produce granulations from its surface. When also, the front of the bag has alone been taken away, and the skin closed over the back of it, an union takes place between

the skin and cyst. When also a wen has burst, or has been punctured, so that a small aperture has been left in it, which has occasionally given discharge to its contents; I have seen the cyst fill repeatedly by a secretion of the same nature, but more fluid than the contents which were at first found in it.

Some notions have of late been entertained, that these cysts may be of the nature of hydatids; it may not, therefore, be improper, in order to enable the reader to form his own judgment on this subject, to mention the following case.

A gentleman had a wen in his cheek, which spontaneously burst, and on which Mr. Hunter tried various stimulating means to induce the cyst to granulate or adhere, so that no further collection might ensue. His endeavours, however, were unavailing; for, after the opening closed, the cavity of the cyst filled again, and the wen was as complete as before, and had increased in magnitude. It was situated unfavourably for removal, and the patient was averse to an operation. It lay so deeply on the buccinator muscle, as to be as perceptible from the mouth as on the cheek; and there was a great risk of dividing the parotid duct, in an operation undertaken for the removal of the tumour. The deformity which the wen occasioned, was, however, considerable, it being as big as the largest kind of walnut; and the patient was very desirous of having the tumour lessened, though very averse to having it extirpated. He had for this purpose used salt and water, which made the skin inflame. Having consulted me, I told him that if stimulating applications were to do good, they could only effect it by causing the skin to ulcerate, and the contents of the wen to be discharged, as had formerly happened; all which

might be accomplished in a more direct, and less teasing manner, by just pricking the bag with a lancet, and squeezing out its contents. I thought it also probable, that the small wound would heal, and that the operation might be occasionally repeated. The patient was pleased with the proposal, and it was put in execution. The contents were of the consistence which is termed meliceritous, and had a peculiar odour. No inflammation ensued, and the wound healed; but, after a little time, it opened again, and gave discharge to a small quantity of watery liquor, of precisely the same odour as the original contents, and the little puncture again closed up. From that time to the present, which is now some years, the wound has occasionally opened, discharging a small quantity of sometimes a more fluid, sometimes a more meliceritous substance; and after this discharge, the aperture closes up. This circumstance occurs but seldom; perhaps every second or third month. The aperture is so small as not to be discernible; no plaister is worn upon it, and the patient has got rid of a considerable deformity, upon what he thinks very easy and satisfactory terms.

I have mentioned these circumstances to illustrate the functions of the cysts of these tumours; and to show what may be done in some cases, as a palliation of these diseases. It is not, however, meant to recommend such practice; for, on the contrary, it will be shown hereafter, that it is dangerous to tamper with encysted tumours; and, indeed, I should not have ventured on this palliative mode of treatment, in the case related, had I not known from the effects of the former conduct which had been pursued, that the cyst and contiguous parts were of an indolent nature, and not disposed to re-act in consequence of violence done to them.

The contents of encysted tumours have been denominated from their consistence, steatomatous, atheromatous, and meliceritous. To this ancient distinction must be added another: the cyst sometimes secretes a substance like nail or horn; which is protruded when the skin ulcerates, hardens, and is pushed forwards in proportion as the cyst secretes more of this substance, so as to appear like horns; as has been shown by Mr. Home in the Philosophical Transactions.

There is yet another curious circumstance to be noticed with relation to cysts; which is, that they have sometimes hairs growing from their interior surface. This happens in those cysts which are not unfrequently met with in the ovary.*

But though the cysts of encysted tumours must be considered as possessing the organization of other parts, and as secreting and absorbing surfaces; yet their vessels are probably very minute, and not endued with a degree of strength adequate to the ordinary reparation of injury. If they produce granulations they are flabby, and the sores are not disposed to heal.

It is no uncommon circumstance to meet with wens, that have burst spontaneously, and have thrown out a fungus, which, like a foreign body, prevents the surrounding integuments from healing.

Most parts that are weak, are irritable when excited, and apt to assume diseased actions. This frequently happens in a striking manner in the cysts of these tumours; and as, perhaps, surgeons

* Some of the tubercles which occur in the viscera seem to be formed by the deposition of various kinds of substances from the surface of a cyst, which appears to be the first formed and most essential part of the disease.

are not sufficiently apprized of the bad consequences sometimes occurring from the inflammation of wens, and as it is proper to show the danger of irritating these diseases, I shall relate a few cases to illustrate this fact.

A woman, about forty years of age, was admitted into St. Bartholomew's Hospital, with a frightful fungus growing on the front of the belly, below, and to the right of the navel. She had been a healthy lusty woman, but was greatly deranged in health by the pain and irritation which this had occasioned. She described it as being a wen which had burst, and her account was afterwards verified by dissection. The fungus bled, and she could scarcely bear the softest dressings to be applied to the part. Nothing mitigated her sufferings so much as lint dipt in a solution of opium, and kept moist by very frequently squeezing on it, from a sponge, a sufficient quantity of the solution. Nothing allayed the constitutional irritation but large doses of opium. She died exhausted in the course of a fortnight.

I removed the cyst from off the aponeurosis of the external oblique muscle, where it covers the rectus, leaving the tendinous expansion quite clean and unaffected. The cyst had ulcerated in two small places, so that the fungus which it contained was visible from behind.

A man between forty and fifty years of age, who was in St. Bartholomew's Hospital, had a wen on his back, which ulcerated, discharged an atheromatous substance, and afterwards inflamed, and threw out a fungus. Extensive erysipelatous inflammation took place in the surrounding integuments, and his constitution was greatly deranged by irritation and fever. When he was almost exhausted by these circumstances, and before any local amendment had taken place, another wen of the

same nature, which he had on his right thigh, ulcerated, and was followed by the same consequences; and, conjointly, they soon destroyed him.

A gentleman, of a stout make, and about forty years of age, had a tumour, supposed to be sarcomatous, which had formed beneath the integuments on the lower edge of the pectoral muscle. It was attended with severe pain occasionally, at which time it rapidly increased in size, and produced a great deal of fever and irritation,* which made him look very sickly, and grow very thin, and caused some persons to deem the disease cancerous.

When the tumour had acquired a magnitude of about four inches in length, and three in breadth and depth, he submitted to its removal; the integuments were divided and turned back, and the tumour dissected off the surface, and, in some degree, from under the edge of the pectoral muscle.

When the tumour was examined, it was found to be composed of a steatomatous substance, contained in a thin capsule. The substance resembled that which I have described as being sometimes found in cells in the testis, or intermixed with the diseased organization of that part. It was firm, and resembled cheese in its yellow colour and unctuous appearance; but it was not unctuous to the touch.

* Circumstances like these should, I think, be particularly attended to in the history of tumours; for they may serve, perhaps, to characterize the disease in which they occur. Tumours of an innocent nature commonly increase in an equal ratio, and do not excite irritation in the contiguous parts, or in the constitution. Yet this, as a general rule, has exceptions. Some of these have been stated under the head of pancreatic sarcoma, occurring in or about the mammary gland.

The wound made in the operation soon healed, and the patient's health was restored to as good, or seemingly a better state than before the formation of this disease. He also regained his usual athletic form. But in less than three months after his recovery, two new tumours formed, one above, and the other below the cicatrix of the wound. The patient did not particularly attend to them till they had attained a size equal to that of a large walnut. To dissect out both these tumours, and make so free a removal of parts as to render it probable that no new growth would ensue, seemed to be a very formidable operation; and, as the nature of the former tumour was known, and it was supposed that these were of the same kind, it was agreed to puncture the upper one, to express the contents, and await the event. This was done by a puncture of half an inch in length, made by an abscess lancet. The contents were exactly like those of the original tumour. Vehement erysipelatous or irritative inflammation took place, and sloughing about the diseased part: the inflammation rapidly extended to the opposite side of the thorax, and then down the integuments of the abdomen to the groin. The derangement of the constitution was as violent as the local disease, and in about a week the patient died.

These cases are related to show the danger of irritating wens, either of an irritable nature, or occurring in irritable habits; and because I have not met with such cases described in books in a manner adequate to the importance of the subject.

It deserves to be noticed in this brief account of encysted tumours, that the disposition to form wens prevails frequently in many parts of the body at the same time. It is not very uncommon to see many, even twenty or thirty wens, alike in their

structure and contents, in various parts of the same subject Nay, the disposition seems sometimes to be hereditary, and transmitted from parents to their children.

The subject would appear to me to be incomplete were I not to notice the formation of cavities, containing different substances, and which can neither be accounted encysted tumours, nor abscesses. The cysts are like the cysts of abscesses; they are secreting surfaces, not regular in shape, but varying according to the form of the parts, amongst which they are produced. They adhere also, like the sides of abscesses, to the circumjacent parts, and are not easily separable from them like the cysts of wens. These cysts sometimes contain a kind of serum and hydatids, like the cysts formed in the liver, and other viscera. Sometimes they contain a number of granular substances of a white colour, having a polished surface, and generally an oval figure, which resemble pearl barley, but the granules are generally smaller. I have seen the cysts containing hydatids, in the back and about the hip, on the shoulder, and in front of the elbow joint.* I never met with any containing these

* The cysts from which such substances are discharged, are, in general, very irritable. If they are kept open for some time, an alteration seems to take place in the actions of the part, and they no longer continue to secrete that matter which forms the granules I have described, nor the fluid in which hydatids are found. As these diseases are not so frequent as to be familiarly known to surgeons, whose practice is not extensive, I will relate two cases to show the nature and treatment of such diseases.—Case. A young lady had a considerable collection of fluid beneath the biceps muscle of the arm. It protruded on either side of the muscle, and reached to about three inches above the elbow joint. I punctured it with an abscess lancet, and discharged about six ounces of serous fluid, containing a few hydatids. The wound, which was an inch in length, was dressed with spermaceti

granular bodies but about the hip, and in the thecæ of tendons; I have therefore conjectured

salve, a bread and water poultice applied, and the arm was supported by a sling. For a few days serous fluid oozed from the aperture, when the external wound had closed so much as to prevent its escape. I introduced a probe into the cavity, and afterwards a small tent, to prevent the aperture in the cyst from closing. This trivial irritation caused great disturbance in the parts, to a considerable distance, which became heated and swollen, and so painful, that I dared not to persevere. The wound was suffered to heal, which it soon did; but the fluid collected again. Instructed by this experience, I now opened the cyst with a lancet, introduced a probe-pointed bistoury, and enlarged the aperture to the extent of an inch and a half. This wound was dressed superficially; it was three weeks before it closed, and afterwards no collection of fluid took place in the cyst, and the patient remained perfectly well.—Case. A gentleman had for many years suffered great inconvenience from a collection of fluid beneath the fascia of the ring finger, the palmar fascia, and that of the fore-arm. The collection seemed to have begun in the palm of the hand, but had extended itself half way up the theca of the ring finger, and passing under the carpal ligament, had made its way by the ulnar side of the flexor muscles, and protruded the fascia of the fore-arm in that part which intervenes between the flexors of the fingers and the flexor carpi ulnaris. At this part the fluid was nearest to the surface, and it was agreed, in consultation, that it should here be opened. I accordingly made a division of the skin about two inches in length, to expose the fascia of the fore-arm, which I divided to the extent of an inch and a half. I then distracted the muscles a little, when there gushed out a large quantity of fluid, containing a number of the largest granules that ever I had seen formed in the sheaths of tendons. Several of them were as big as small grapes. By pressing the palm of the hand more were forced out, yet I remained uncertain whether the whole were discharged. The wound was dressed superficially with spermaceti salve, a bread and water poultice applied, and the arm kept supported in a sling. Three days after the operation, fearing lest some of the granules might remain, I introduced the point of a varnished catheter, and impelled some warm water beneath the fascia of the hand. No granules returned with it; but this experiment caused great nervous irritation in the part, and in the constitution

that these cysts are enlargements of the bursæ mucosæ.

The greater number of these cases, which I have seen, have ultimately, but very slowly, done well. However, some cysts, upon becoming open, produce great and even fatal irritation in the contiguous parts. Sometimes cysts, as Mr. Hey has lately remarked, produce that appearance, which he has called fungus hæmatodes. Of this circumstance, as it appertains to the present subject, I shall relate an instance; but to speak more largely of that disease, would be deviating from the plan of this paper, and would be unnecessary, as the numerous and accurate cases, which Mr. Hey has related, show that this disease may exist without being connected with cysts.

A girl about sixteen years of age, who was in St. Bartholomew's Hospital, had a collection of fluid under the triceps extensor cubiti, near to the olecranon. When I first saw it, it was not larger than a pullet's egg, but it increased, notwithstanding the means which were employed to discuss it; and, in about twelve months, it presented itself beneath the integuments on the outside of the arm, in the space between the extensor and flexor muscles, a little above the elbow. Upon com-

in general. Nothing therefore was further done that could irritate the parts, and the wound healed in about six weeks, in the following manner: The skin on either side of the wound became tumid, and threw forth exuberant granulations to such a height, that a swelling as big as half an egg cut lengthwise, projected above the level of the skin; as the granulations from either side touched, they coalesced, and thus the divided fascia was covered. The granulations being afterwards absorbed, the cicatrix appeared like one from a common cut, and the integuments were flat, and in a natural state. I saw the patient two years after this operation, and there had been no new collection of fluid.

pressing the projecting integuments, a fluctuation of fluid was felt beneath the triceps muscle in the inside of the arm, and the collection seemed to extend high up on the back part of the os brachii. As the parts containing the fluid seemed more disposed to increase in dimensions, than to give way and discharge their contents, the collection was opened where it pointed, and a quantity of serum was discharged. On introducing the finger, some strata of coagulated blood came away, and this was succeeded by so great an hemorrhage, that it became necessary to enlarge the wound, in order to search for the bleeding vessels. In proportion as this was done, and more coagulated blood was detached from the sides of the cyst, which had contained both it and the serum, the hemorrhage increased, and the blood flowed so profusely from so many and such large arteries, that it was impossible to control its effusion. Amputation seemed unavoidable, and was performed as high up as possible, but not clearly above the cyst, some part of which remained amongst the muscles of the stump.

On examining the amputated limb, a thick and firm stratum of coagulated blood was found adhering to the sides of a cyst, which extended from a little above the olecranon, where it was large, to nearly the upper part of the os brachii, where it gradually tapered to a small size. The upper part of the cyst was cut off from the rest by the amputating knife, and of course remained upon the stump. At first, the stump appeared to do well, but shortly after the sides of the wound separated, considerable inflammation came on, and a fungus was thrust forth. Great fever and irritation accompanied this local disorder, and the girl died.*

* An unrestrainable hemorrhagic tendency seems to be the essential character of that disease, which Mr. Hey has

The treatment of encysted tumours resembles that of the sarcomatous kind. By abstracting blood and heat from the part it is probable the growth of them will be stopped, and the disease made for a time stationary. They are not likely to be dispersed; and, as the magnitude is increased by delay, and the spontaneous opening of the cyst generally leaves a vexatious and intractable sore, and sometimes is attended with more dangerous consequences, the early removal of the disease is the best practical conduct that can be pursued.

Another genus of tumours is the osseous. Those which hang pendulous into joints are sometimes bony. Osseous tumours also form, though not frequently, in other parts: of this circumstance I shall relate the following instance. A woman was admitted into St. Bartholomew's Hospital, with a hard tumour in the ham. It was about four inches in length and three in breadth. She had also a tumour on the front of the thigh a little above the patella, of less size and hardness. The tumour in the ham,

denominated Hæmatodes. That it takes place from diseased structures is manifest; yet I have known it happen without any morbid growth having preceded it. I shall briefly relate a case of this description, because the term fungus hæmatodes seems to be a name commonly now applied to every bleeding fungus, whilst that hæmatodal disposition, which Mr. Hey has described, is a very rare occurrence.—Case. A young man, who was out of health, complained of stiffness and pain in the bottom of his belly, and took to his bed, declaring his inability to move about. Suddenly a swelling formed above the Poupart's ligament, which rapidly increased, and the skin ulcerated. A frightful fungus seemed to present itself, and an uncontrolable hemorrhage ensued. When the case was examined after death, all that bulged out could be removed by the finger or sponge, and appeared to be coagulated blood, rather than fungus, and at the bottom nothing was seen but the abdominal muscles, which had that bruised and brownish appearance which Mr. Hey has described.

by its pressure on the nerves and vessels, had greatly benumbed the sensibility, and obstructed the circulation of the leg, so that it was very œdematous. As it appeared impossible to remove this tumour, and, as its origin and connections were unknown, amputation was resolved on. On examining the amputated limb, the tumour in the ham could only be divided by a saw; several slices were taken out of it by this means, and appeared to consist of coagulable and vascular substance, in the interstices of which a great deal of bony matter was deposited. The remainder of the tumour was macerated and dried, and it appears to be formed of an irregular and compact deposition of the earth of bone. The tumour on the front of the thigh was of the same nature with that in the ham; but containing so little lime, that it could be cut with a knife. The thigh bone was not at all diseased; which is mentioned, because, when bony matter is deposited in a limb, it generally arises from a disease of the bone. This case, however, shows that the vessels of a tumour may secrete phosphate of lime, and convert it into an osseous substance, without any manifest cause existing to excite such ossific inflammation.

Vascular tumours also may doubtless become converted into a substance resembling cartilage, like those found in joints; and their hardness might then exclude them from the genus sarcoma. I have not however met with such instances.

The diseases which I have been describing may be considered as edifices which are built up by diseased actions, and in which those diseased actions continue to reside. The actions themselves do not admit of examination, though the structures do which they erect. Therefore, as Dr. Baillie has observed, it is by an examination of diseased struc-

ture that we must be slowly led to a knowledge of diseased actions. It does not follow as a certain consequence, that similar diseased actions will, in every instance, produce precisely the same diseased structure; though it is highly probable that they will do so in general. This observation would diminish our surprize if, in some rare instances, we found cancer existing where a cancerous structure was not strikingly manifest; or if, in others, a structure like that of cancer was observed where no cancerous actions were apparent. The scirrhous tumours, which form beneath the peritoneal covering or lining of the uterus, have something of the structure of cancer, and yet they are not cancerous. In all cases where tumours are formed we must suppose an increase, and, in some degree, a disordered action of the vessels which form them; but, in many these actions possess but little diseased peculiarity. As in every case of growth, in the re-production of destroyed parts, the gelatinous substance of the blood is first deposited, and afterwards rendered vascular, therefore I have considered a tumour formed in this manner as one of the most simple kind, and possessing the least of diseased peculiarity; but I am aware that I may have included under this general character tumours of essentially different natures. In the adipose sarcoma there must be some peculiarity in the arrangement and actions of vessels which form this tumour; but it must be accounted a natural rather than a morbid peculiarity, The pancreatic sarcoma, I should suppose, differed but little from the first species. It may be considered as a new growth characterized merely by the peculiarity of its appearance, in consequence of its being separated into many distinct parts, which sometimes cohere by a looser kind of texture, and sometimes are separated by a firmer sub-

stance. The connecting medium appears like the thickened cellular substance of the part in which the newly organized matter is formed. Indeed I have sometimes pressed out the separated portions of this substance from the connecting medium which environed them. In the mammary sarcoma I suspect some diseased peculiarity to exist, as has been mentioned in speaking of that subject. In the tuberculated sarcoma the predisposition to that disease seems general on the part of the constitution. In the medullary sarcoma the disease seems local, in the first instance, and propagated by means of the absorbing vessels to their glands, and frequently in a course retrograde to that which the absorbed fluids would naturally take; but in the advanced state of the disease the morbid disposition appears to be general. In carcinomatous sarcoma the disease appears to begin in a point or small district, and to extend in every direction, as rays do from a centre, affecting every surrounding part, whatever may be its nature. The diseased actions also, though they may be at times more violent or more tranquil, never cease. This disease is also extended through the medium of the absorbing vessels in the direction which the absorbed matter would naturally take.

# SURGICAL OBSERVATIONS.

## ON CHRONIC AND LUMBAR ABSCESSES.

CHRONIC abscesses differ from those produced by phlegmonoid inflammation in many particulars. In diseases of an active and violent nature, the contiguous parts become affected, whilst in those of an indolent disposition they remain free from disease, and unaltered in structure. An absorbent gland, for instance, may be enlarged to a considerable size; yet, if the disease be of an indolent nature, the surrounding cellular substance is loose and pliant. On the contrary, if one or two of these glands undergo active inflammation, the surrounding parts participate in the affection, and all traces of the glands primarily affected, are lost in the more general inflammation and abscess. In phlegmonous abscesses, the inflammation which was most violent in the centre, and had there terminated in suppuration, had, at the same time, induced adhesion of the surrounding cellular substance; and thus, the sides of the abscess are, as it were, walled in and supported, and the extension of the disease in the circumference is to a certain degree prevented. It also appears, that it is very much owing to the parts covering the front of the abscess participating in the

irritation, that the matter so readily makes its way to the surface, and is discharged.

On the contrary, in chronic abscesses it generally happens, that very little adhesion of the surrounding substance takes place, and the matter is more at liberty to extend itself in all directions; at the same time, the parts covering it do not participate in the disease, they therefore do not inflame and ulcerate till their distention induces them to do so, and such a degree of distention may not take place till the abscess has acquired an enormous magnitude.

Now, if it could be proved, and I think it practicable, that chronic abscesses are not from their nature deleterious diseases, but are disturbing and destructive to the constitution in proportion to their magnitude, we should then clearly see, that the objects of surgery in their treatment ought to be those of preventing their increase, or reducing their dimensions.

As inflammation varies in its degree, so there are many abscesses neither strictly speaking phlegmonous nor chronic, but of an intermediate nature. I think, therefore, it may be useful to insert a case of purely chronic abscess, as an illustration of the preceding remarks.

CASE I.

An abscess containing twelve ounces of well-formed pus took place beneath the integuments covering the upper part of the pectoral muscle; it elevated the skin, and had formed a globular kind of tumour. This suppuration had been attended with scarcely any pain, and the integuments, although distended, were indolent, and appeared perfectly healthy and natural. I punctured the ab-

scess with a lancet conveyed obliquely between the integuments and the cyst, evacuated the contained pus, and closed the aperture with sticking plaster: but on the re-accumulation of matter it was no longer confined in a cyst, but became diffused through the cellular substance leading to the axilla, in which a slight inflammation was produced. I was, therefore, obliged to make a new orifice, and leave it open, that the secreted matter might have an outlet, and not extend disease, by thus pervading the cellular substance.

The surface of the cysts of all abscesses has the power of secreting and absorbing their contents. Even phlegmonous abscesses occasionally disperse, and many cases are on record of large abscesses, which I conclude were of a chronic nature, being dispersed in consequence of the occurrence of a diarrhœa. It appears to me, that the cysts of abscesses perform the same function with respect to their contents that the membranous surfaces of cavities do in cases of dropsy. In either instance, if secretion exceeds absorption, the disease enlarges; if it be equal, the disease is stationary; and if it be less, the disease diminishes.

With this view of the subject, and knowing the danger arising from the opening of chronic abscesses, I have endeavoured to disperse them, and I have sometimes been successful in my attempts. As an instance of what may be accomplished, I relate the following case:

### CASE II.

A gentleman about twenty-six years of age, consulted me on account of a very large abscess which had formed amidst the muscles of his thigh. It protruded the fascia on the front of the vastus internus

muscle, from the patella to above the middle of the thigh: the posterior muscles of the thigh also bulged outwards, so as to give a considerable convexity to the back part of the limb. The patient looked unhealthy; he was languid and irritable; he had a furred tongue: the actions of his bowels were irregular, and the secretion of bile was deficient or faulty. I desired him to drink a pint of the decoction of sarsaparilla daily; to take five grains of the pil. hydrarg. every second night, and to pay strict attention to keep his bowels regular. I also recommended a bandage to give support to the sides of the abscess. However, it continued to increase, and in about six weeks the integuments at the lower part became more prominent than elsewhere, and felt heated and uneasy. Fearful of their becoming inflamed, and frustrating the plan of treatment which I designed to pursue, I opened the abscess with an abscess lancet, making a wound about three-fourths of an inch in length. About thirty ounces of serous pus flowed through this orifice, but the current was very frequently obstructed by large clots of that flaky substance which is so commonly found in such abscesses. Towards the end of the discharge clots of blood obstructed the orifice, and they were so numerous and large, and came out of the aperture with so much difficulty, that I thought it better to close the wound, even before the abscess was completely emptied, than run the risk of irritating the sides of the wound by too much poking, or of admitting air into the cavity of the abscess. I therefore cleaned and closed the sides of the wound by sticking plaster, and applied a roller round the limb. The wound healed, and the patient's health was in some degree improved. At first the cavity of the abscess filled rapidly, so that the fascia protruded again. The protrusion, however, did not increase,

and the disease seemed stationary. After about three weeks the patient was permitted to take exercise on account of his health, and he generally slept in the country. By these means, and with the continuance of his medicines, his appetite became good, and his bowels regular. He then left off the sarsaparilla, and took the pil. hydrarg. only, when he observed that the fæces were not of a proper colour. As the patient's health amended, the abscess decreased, so that in about six months there remained no evidence of such a disease having existed. After some time, the patient went into the army, where fatigue and irregularity of diet made him ill again, and he perceived some fluid in the abscess. He, therefore, relinquished this mode of life. On the restoration of his health, to which the use of the same medical means seemed to be contributory, no vestiges of the abscess remained; and though many years have now elapsed, no return of the local disease has taken place.

As chronic abscesses in general form in consequence of a disordered state of the constitution; and as it is subject to great disturbance when they become open, so it is requisite to endeavour to improve the general state of health prior to that event. By such means I have seen several chronic abscesses dispersed; and even if our endeavours have only the effect of rendering the abscess stationary, whilst the patient's health is improving, it is productive of great good, since it enables the constitution to encounter that disorder attendant on the abscess becoming open. Such topical applications as will afterwards be mentioned, may be employed at the same time, with a view to render the abscess stationary, or to diminish it, by lessening the secretion into the cavity, and by promoting absorption from it. I may also add, that I have seen several ab-

scesses, which continued to enlarge under such management in the first instance, dispersed by it, after they had been once punctured.

The foregoing remarks and cases are designed to illustrate the nature of chronic abscesses in general, and I now proceed to consider the most important species of such a disease that we meet with in practice, I mean the lumbar abscess. Some lumbar abscesses can indeed scarcely be denominated chronic; they are formed with so much pain, the pus which they contain being good, and so unlike what is generally found in the cysts of indolent abscesses, that we must suppose the disease which produced it was of a different nature. I have seen also inflammatory fever induced when such an abscess has become open, which was an additional proof of its being of a phlegmonoid nature. Such occurrences are indeed very rare: but it very commonly happens that the formation of lumbar abscesses is attended with more pain, and other inflammatory symptoms, than are incident to chronic abscess in general.

Whatever the nature of a lumbar abscess may be, the surgical treatment of it must be similar to that of a chronic abscess; for as the matter presents in a part of the body which is so remote from that where it was originally formed, as not to sympathise with the disease; so the progress of the abscess, before breaking, will resemble that of a chronic abscess. To use the language of Mr. Hunter, a lumbar abscess, where it presents, is to be considered as an abscess in the part, and not as an abscess of the part.

As lumbar abscesses in general descend along the psoas muscle, under Poupart's ligament, and present beneath the fascia of the thigh, the resistance of the fascia affords an additional obstacle to

the progress of the matter to the surface, so that such abscesses, if left to themselves, often acquire an enormous magnitude before they spontaneously open.

Lumbar abscesses also, in general are not simple diseases; they arise from and communicate with carious vertebræ; which circumstance is, I believe, the cause of their frequent fatality. The first eight cases that I attended, after I had adopted a new mode of opening them, were simple abscesses, and not arising from disease of the bone; which led me to believe, that they were more frequently unconnected with diseased bone than later experience has taught me. The general opinion of surgeons, in which I entirely concur, is, that lumbar abscesses most frequently arise in consequence of diseases of the vertebræ, and they should certainly all be treated as if such was their origin.

Before I proceed to describe the particular treatment which I would recommend in chronic and lumbar abscesses, it will be useful to enquire into the cause of that constitutional disorder, which is so generally consequent to their becoming open. It has been ascribed to the admission of air into the cavity of the abscess, or to the absorption of pus from it. That it is not owing to the former, we infer, because air does not appear to be stimulating to those surfaces of the animal body, to which it is not naturally applied. The air which escapes from a wounded lung, and renders the cellular substance emphysematous, produces no inflammation of it. Air has also been blown into different cavities of the body, to ascertain its effects; and it has been absorbed from them without having excited any inflammation. Neither does air appear to be stimulating to the exposed surfaces of ulcers which are in a state of disease. Yet, though air seems to have

no stimulating property to such surfaces, and therefore cannot be assigned as the cause of that irritation and inflammation consequent to the opening of an abscess, yet it is of the highest importance in pursuing the treatment which I have recommended in these abscesses, that no bubble of air should be admitted into the cavity, because it would probably cause the putrefaction of the fluid contained in the abscess, the absorption of which would be very deleterious. To show the consequences that might arise from such an occurrence, and to urge the necessity of all that caution which I shall recommend in opening lumbar abscesses, I relate the following case:

CASE III.

A surgeon discharged a large quantity of pus, containing flakes, from a lumbar abscess, which presented itself beneath the fascia of the thigh. The matter was discharged through a wound made by an abscess lancet, and in holding open the orifice with probes, in order to give discharge to some coagula, a bubble or two of air was admitted into the cavity of the abscess. His assistant perceived this occurrence, and mentioned it to me prior to the coming on of those symptoms which afterwards took place. When the abscess was emptied, the wound was closed with sticking plaster, and bound down by many straps of plaster placed over it. On the third day the patient was attacked by so violent a putrid fever, that it could be compared to no other, unless to such as is occasioned by the plague. The fascia of the thigh was elevated as much as it had been before the operation; the skin was very hot, and of a dusky colour. On removing the straps and coverings

from off the wounded part, a large blast of fœtid air burst from the aperture, which was followed by the discharge of a considerable quantity of a very offensive and bloody fluid. The patient lived but twenty hours; and, on examining his body afterwards, a considerable quantity of bloody fluid was found effused into all the large cavities.

If the notions which have been delivered respecting abscesses be correct, I mean, that there is continual secretion, and continual absorption from the cyst, as from a membranous surface, or from that of an ulcer, then it would follow, that the absorption of pus cannot be productive of fever. Though absorption of pus is continually taking place, yet no fever occurs before the opening of an abscess, neither does it come on where abscesses are dispersed, and where such absorption must indisputably have happened. It is true, in these cases, the pus is generally inoffensive in its qualities; it might be contended, that though it be admitted into the circulation with impunity, yet some of the fœtid matter usually discharged from the surfaces of open abscesses, being absorbed from them, might prove the cause of the fever. We do not however find such fever produced by the absorption of fœtid matter from the surfaces of large ulcers. We frequently apply the term putrid to substances merely fœtid, as well as to those in a state of chemical putrefaction; and from this inaccuracy of language, I suspect the equal inaccuracy of opinion has arisen, which has led to the belief of deleterious consequences succeeding to the absorption of matter. I need not discuss these subjects further, because the enquiry into the true cause of the fever will furnish arguments to refute false notions.

An attentive examination of the subject will, I

believe, convince us, that the fever depends upon the state of irritation and inflammation which takes place in the cyst of the abscess. First, because its violence corresponds with the degree of local inflammation. Thus, in the old method of opening chronic abscesses by an incision of considerable length, the fever was much more violent than when the abscesses were suffered to break of themselves, or when they are merely punctured. Secondly, because the kind and degree of fever accords with the state of inflammation and irritation existing in the cyst of the abscess. Thirdly, when a lumbar abscess opens spontaneously, in a manner productive of the least possible irritation to the cyst, the patient sometimes remains for many days without heat or pain in the part, and without fever. Afterwards, when the cyst has become irritated and inflamed, and the constitution disturbed by a peculiar kind of fever, the symptoms may, and generally do subside, and the patient merely feels languid, and slightly hectical. If local irritation is again excited, again the concomitant fever takes place. The cases which I shall afterwards relate will, I think, prove these assertions, and they have induced me to believe, that the disturbance of the constitution at large depends upon, and accords with the local disease. Such opinions lead to this practical conclusion, that if we wish to prevent or mitigate the fever, which exhausts the patient's powers, we should do every thing to prevent and allay the local disorder, which is likely to arise in the abscess.

There seems nothing mysterious or difficult to account for, in the effects resulting from an abscess becoming open. If any of the natural cavities of the body were in the same state, inflammation would ensue, and would produce a fever corres-

ponding to it in its nature and degree. From the weak and peculiar state of constitution, subject to chronic abscess, both the local inflammation and the concomitant fever are in general of a peculiar kind: the local inflammation partakes of what would, in general, be denominated an erysipelatous nature, and the fever of a violent and rapid hectic. I have however known the opening of a lumbar abscess productive of inflammation of a phlegmonoid character in the cyst, and then the constitutional affection was likewise what we term inflammatory fever.

Having thus endeavoured to investigate the cause of the evils resulting from a chronic abscess becoming open, I may further add, that if the opinions which I have formed of them be correct, the danger must greatly depend upon the dimensions of the abscess. A chronic abscess, beneath the fascia of the thigh, may be opened, when it contains four ounces of pus; and if the surface becomes irritated and inflamed, it may induce a degree of constitutional disturbance and fever; yet such an abscess neglected, may increase till it holds four quarts;* and then, if it becomes open, and has the same degree of local disease, and it were granted that it should only act upon the constitution in the same proportion, it must produce more than thirty times the degree of fever. If also we are to ascribe the weakness consequent to the opening of chronic abscesses in any degree to the drain of fluids which takes place from them, it will be in the same proportion greater in the latter than in the former case. It seems however probable, that it is the violent

* I have discharged four ale-house quarts full of matter from beneath the fascia of the thigh.

actions which exhaust the patient's strength, and not the loss of fluids; for in dropsies of the ovary a much greater loss of more nutritive fluids is not attended with weakness in any material degree.

After this discussion of the nature and cause of the ill consequences resulting from the opening of chronic abscesses, we may proceed to establish rules for their treatment. The first object, I think, is to disperse, if possible, lumbar abscesses, because it is most probable that the matter is in contact with diseased bones; and that the inflammation consequent to the abscess becoming open, will be communicated to those parts.

With this view, an issue should be made in the loins, which is likely to be beneficial by its counter irritation, even when the abscess is not connected with diseased bone; but when it is, then an issue will be still more serviceable and necessary. The patient also should be kept in bed till all inflammatory tendency, which will be indicated by the increase of the abscess, has ceased. Then exercise in the open air may be permitted, on account of its beneficial operation on the constitution of the patient.* It should indeed be our unremitting object throughout to invigorate and tranquillize the constitution; and the means which I should employ for this purpose, are those which tend to preserve the digestive organs in, or restore them to a state of health. If the abscess becomes open notwithstanding all our endeavours to the contrary, these measures will enable the constitution to bear up against the disease; and as such local diseases are the consequence of a weakened and disordered

* Probably it would be best to exercise with crutches, as the lumbar muscles on the affected side would then be exempt from action.

state of body, they may, by relieving the cause, remove at the same time the effects, as has been shown in the second case.

That lumbar abscesses may be dispersed by these measures, will be proved by the cases which I shall afterwards relate: that we shall often fail in our endeavours to disperse them, is indeed highly probable in reason, and equally proved by occurrences in practice.

Let us then suppose, that a lumbar abscess treated in this manner continues to increase, that it protrudes the integuments; that they, from distention, become irritated; that their temperature is slightly augmented; what are we then to do? Are we to wait till evident signs of inflammation appear? I think not. I would then relieve them from distention, by emptying the abscess through a wound made by an abscess lancet. I would open the abscess for a reason which appears paradoxical on its first proposal, which is, that it may be kept closed. We can empty a cavity, and by healing the wound, keep it afterwards shut, and no inflammation ensues. If nature opens the cavity by ulceration, the opening is permanent, and the inflammation consequent must be endured. When I first treated abscesses in this manner, I punctured them with a trochar. I now use an abscess lancet, which is introduced with very little obliquity, so far that the wound of the cyst of the abscess should be half an inch in length, and that of the integuments of course a little longer. A wound of that size is generally sufficient to give discharge to the solid flakes which will occasionally block up the opening, without much poking. It is necessary that the flow of matter should be uninterrupted, so that no air should gain admittance; it is therefore right to make pressure on the abscess in proportion as it

is emptied. The abscess where it presents itself is emptied before that part of it in the loins is completely so. The surgeon should then press the sides of the wound together with his finger and thumb, so as to prevent the ingress of air, and desire the patient to cough repeatedly, which will impel the matter from the internal part of the abscess into that which is punctured. When the abscess is emptied as much as possible, the wound should be attentively wiped, and the edges placed in exact contact, and retained in that state by strips of plaster. I interpose some lint between the plaster and the surface of the wound, closing it exactly as that made in venesection. I think it useful to put a small compress over the part where the orifice is, and give it a slight degree of pressure by longer strips of plaster. It is of great consequence that the patient lie perfectly still, and that the plasters are not moved. I think it better not to put on a bandage, because then the patient may perceive whether the plasters are right or wrong. I dress the wound every second day. It generally unites by adhesion, though sometimes otherwise, for it may discharge a little, and yet unite firmly. An abscess, thus treated, is as free from inflammation as it was before it was punctured. The abscess will, however, fill again, and that sometimes even rapidly. In the first cases which I attended, I punctured it pretty regularly after the expiration of a fortnight, and I found in general, that the abscess contained about one-third less of fluid. I have, indeed, been obliged to puncture the abscess at first before the end of the fortnight, because it had become distended, and I was fearful that the distention might cause the newly healed wound to inflame, or unclose itself. After having discharged the contents of the abscess three or four times, I found that it was

not necessary, nor indeed easily practicable to puncture it at the end of the fortnight, because it was so little filled and prominent. Since my attention has been more directed to the dispersion of abscesses, I have generally been able, by such means as tend to lessen the actions, and consequent secretion of the cyst of the abscess, and also to promote absorption, to protract considerably the intervals of time at which it has seemed necessary to puncture the abscess, lest it should become distended. Nay, I have been able to disperse many lumbar abscesses after having punctured them twice or thrice, though I was incapable of preventing their increase prior to these measures.

The dispersion of lumbar abscesses is the grand object which a surgeon should have in view throughout the treatment of them. He should endeavour to disperse them, but by means which are, at the same time, calculated to increase the patient's strength. If, however, the abscess increases, and he is obliged to open it, in order to prevent its becoming open spontaneously, he should still pursue the same measures; for the necessity of his puncturing it again is thereby diminished, and he gains time, which he employs in endeavouring to invigorate the constitution, and diminish the disease of the bone, upon which perhaps the abscess depends. Suppose, however, he is unable to effect his chief design, that of dispersing the abscess; suppose after having punctured it five or six times, at long intervals, one of the punctures inflames and ulcerates; it must, I think, be evident, that great good has been effected by the measures that have been pursued. After a lumbar abscess has been punctured, the fluids secreted into it, will flow into that part where there is the least re-

sistance, which is the part that has been punctured. The pressure of respiration will urge them from the original cavity into the now vacant space, where the abscess had presented itself. The original cavity being a long time thus kept empty, will contract into a small fistulous tube.

Those who are advocates for letting lumbar abscesses open themselves by ulceration, because it imparts less irritation to the cyst than a wound occasions, have in this case their wishes gratified; a much reduced lumbar abscess does, when treated in this manner, open by ulceration. If there be any truth in the reasonings which I have employed, showing that the constitutional disorder will be in proportion to the extent of the surface affected with disease, that surface is now comparatively small.

It must however be granted, that under these favourable circumstances, when the abscess leads to carious bones, the disease is generally, though not constantly, fatal. Instances have been known of pieces of mouldered vertebræ making their way through the fistulous remains of the abscess, and obtaining an external outlet; and yet the patient has recovered. As we cannot know whether the bone be diseased or not, and as these abscesses so generally arise from that cause, we should always act with a caution suggested by the opinion that they do so. When the abscess has become open by the ulceration of one of the punctures, which the surgeon has made in order to reduce its dimensions, or so to alter its state as to increase his chance of dispersing it, the patient must encounter the risk attendant on the disease; but the surgeon has still much to do. The ulcerated part should be dressed with mild salve; evaporating washes, or poultices, should be applied over it; in short, every means should be employed to prevent the cyst in-

flaming, in consequence of irritation imparted to it from the ulcerated puncture. Perfect quietude seems to be essential at this period of the case, for motion of the loins will induce or aggravate inflammation in the originally diseased parts. Sometimes a considerable time elapses before the cyst inflames, and when it does, opium should be given to quiet it. Sometimes the irritation and inflammation of the cyst subsides, and the abscess becoming indolent the constitution is no longer disturbed, and the patient may be permitted to exercise for the benefit of his general health.

Before I proceed to the relation of the cases, from which the preceding views of the nature and treatment of lumbar abscesses were taken, I think it right to relate the case which first suggested to me that mode of opening these abscesses which I recommend; because, it shows that an abscess of this kind, attended with even very favourable circumstances, may prove a fatal disease if mismanaged.

CASE IV.

A young man, about twenty-seven years of age, of a muscular form, and healthy constitution, came from the country to the hospital, to obtain relief from a collection of matter which presented itself in the upper and fore-part of the thigh, beneath the fascia, and immediately below Poupart's ligament. The pain which he had previously suffered in his loins, and the impulse of matter into the tumour upon his coughing, left little doubt of the original seat of the disease. The fascia of the thigh had yielded considerably to the collected pus, so that it did not descend so low as is common, but appeared very prominent. Although he had endured

considerable pain, he had not suffered much from fever on the first formation of the abscess.

A caustic was applied on the tumour to give discharge to the matter, and three days afterwards the eschar was divided. Eight ounces of very perfectly formed, moderately consistent, and inodorous pus issued from the incision.—The sides of the eschar now closed up the wound and prevented any further evacuation of matter. This the surgeon did not attempt to produce, thinking the delay would be useful.

For three days no more fluid was evacuated, during which time the young man remained perfectly well, and his thigh free from inflammation. On the fourth day the eschar became so much loosened in its circumference that part of it gave way, and eight ounces more of similar and perfectly inodorous pus were discharged. In twelve hours after this detachment of the eschar, he suffered much from fever and pain in the part, and the discharge became putrid. In two days the fever, which was of the hectic kind, seemed to be established, and from the sore there flowed a copious and increasing quantity of fœtid pus. His skin was now hot, his face flushed, he sweated profusely in the night, his appetite failed him, his pulse beat 120 in a minute, his tongue was but little altered from its natural appearance, he had no sleep, and was distressingly restless. These symptoms continued about a week without cessation; they then appeared slightly to remit, and proceeded for three weeks in the same manner, with some little diminution in their severity; his strength was now greatly exhausted, the discharge from the abscess very profuse, and in this state it was thought right to have him conveyed into the country, where I am informed he gradually declined, and in about six weeks more he died.

## *Cases of Lumbar Abscesses dispersed without being opened.*

### CASE V.

I was desired to visit a young lady in the country, in order to open a lumbar abscess, which presented beneath the fascia of the thigh. It was not, however, sufficiently prominent to admit of the introduction of a lancet with safety, but there was a very forcible impulse of matter into it when the patient coughed. The patient was about fourteen years of age; her lumbar vertebræ were bent into more than a semicircle, and it is certain that a great number of the bodies of the vertebræ were destroyed by disease. The countenance was flushed, the pulse 120; the body emaciated, and the appetite lost. In short, it appeared to me, and the other medical attendants, that she was not likely to live. I explained to her father, that the opening of the abscess would be almost certain to destroy her; that if a necessity arose from its increase, it might be punctured at a future period, only in order to prevent its being permanently open. I endeavoured to explain to him the necessity of attempting to relieve the disease on which the abscess depended. With this view I recommended rest, and a horizontal position, except when exercise in a carriage was permitted for the benefit of her general health. A moderate-sized blister was also directed to be kept open, by means of the savine cerate, on each side of the spine. Great attention was also paid to improve her health, by obviating errors in the functions of the digestive organs. The patient lived at a considerable distance from London, and I re-

ceived during about fifteen months, frequent letters from her father, containing little else than expressions of exultation and thanks. His daughter's appetite was improved, and her strength increased; the hectic fever had left her; the abscess could no longer be perceived; she had become quite fat and robust, and had grown two inches in stature within the twelve months. After this time, the tone of his letters varied. He thought the discharge from the blisters might produce weakness; and, I believe, they were not continued for any considerable time, though I urged it as strongly as I could. The young lady, however, recovered, and had no return of the abscess.

CASE VI.

A man between thirty and forty years of age, came from the country to St. Bartholomew's Hospital, on account of a lumbar abscess, which had made its way outwards, and protruded the integuments of the back, on the left side of the lumbar vertebræ. The skin was very prominent, and the circumference of the abscess considerable. I think I do not exaggerate, when I say, that twelve ounces of pus were collected in the external abscess. The patient was feeble, and of a sickly aspect, and I thought that the bone was diseased. I desired him to remain in bed, and to keep open a moderate-sized blister on the left side of the loins; endeavouring, at the same time, to produce, by means of medicines, an amendment in his general health. In about two months there was no appearance of any external abscess. The patient was now desired to get up daily, and walk in the open air, but to lie on the bed when he returned. He remained in the Hospital pursuing these measures for two months

longer; and though there was not the least appearance of the abscess during this period, I could not perceive much amendment in his general health or appearance. Indeed, as no good seemed to be done by his residence in the hospital, I advised him to return into the country, requesting him, at the same time, to inform me of the progress of his complaint or recovery; but I never afterwards heard of him.

I was induced to put down this brief account of the preceding case at the time, from the surprize which it excited in my mind, as I had expected it to proceed in a very different manner. Later experience would prevent me from feeling surprize at such occurrences, for I have seen several lumbar abscesses dispersed by similar measures; I mean, counter irritation, and endeavours to improve the patient's health. Though I could relate the circumstances from memory, and even refer to some of the subjects of them, yet the narrative would be little more than a repetition of the fact, and it might tend to induce students to expect such occurrences to be frequent; whilst, on the contrary, I am ready to admit, that they probably will be rarely met with in general practice.

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*Cases of Lumbar Abscesses that have been dispersed after their Contents have been discharged.*

CASE VII.

—— Harris, thirty-five years of age, had a considerable collection of matter beneath the integuments of the abdomen, forming a moderately pro-

minent tumour, about three inches in diameter, and situated just above Poupart's ligament. The patient had suffered a great deal from pain in his loins; and the motion of the thigh had been much impeded, but was now tolerably free. Indeed there was no doubt that the matter had been originally formed in the loins; from whence it was violently impelled, so as to elevate the prominent integuments of the abdomen, whenever he coughed.—By permission of Mr. Long, under whose care he was admitted into the hospital, I punctured the tumour, and discharged about twenty-four ounces of pus, mixed with some flakes of a curd-like substance. The wound healed readily, and no considerable alteration of his health ensued, though he found himself weaker for some days after the operation.—At the end of a fortnight, I made a second puncture, and let out between six and seven ounces of a turbid fluid. He now thought himself so much better than after the first evacuation, that he went out of the hospital; but returned again at the expiration of a fortnight, when, by a third puncture, six ounces of purulent matter were discharged; and, after another week, four ounces more were let out. A caustic was now applied to his loins, and four or five peas used to keep the ulcer open; from which time no matter could be discovered in the abscess during the six weeks that he remained in the hospital.

About eighteen months after this, he was admitted into the hospital on account of a fever and sore throat; and it appeared he had never experienced any farther complaint in his loins.

This case, I think, is very interesting, inasmuch as it contributes to prove that the cavity of a lumbar abscess may be entirely obliterated without the cyst undergoing any of those changes which generally take place when it is laid open.

CASE VIII.

Elizabeth Smyth, aged twenty-seven, had a lumbar abscess, which presented beneath the fascia of the thigh. The previous symptoms rendered the nature of the complaint indisputable; and as she not only showed evident marks of a scrofulous habit, but also felt considerable inability in moving the spine, there was great reason to suspect that the abscess originated from a disease in the bone. She was likewise troubled with cough, and drew in very little air when she inspired. Her appetite, too, was often deficient, and her bowels frequently disordered. It may also be added, that her brother, who greatly resembled her, was at this time a patient in the hospital, under Mr. Long, on account of a scrofulous disease of the spine, which had occasioned an affection of the medulla spinalis. When all these circumstances were taken into account, she certainly appeared a subject by no means capable of sustaining the irritation and disorder which the bursting of a lumbar abscess might be expected to produce. I therefore punctured the abscess immediately, and discharged from it twenty ounces of flaky matter: and having healed the wound, I gave her emetics of vitriolated zinc and copper, and afterwards of ipecacuanha, twice or three times a week, for six weeks. At the end of this time, there was so little matter in the abscess, that I thought it too small to be punctured with safety; and as her health was too infirm to admit of the emetics being continued, I tried to produce absorption of the remaining matter, by passing the electric fluid through the abscess. Very small electric shocks* were accord-

* These small shocks, which, for the sake of distinction, I shall call electric vibrations (a term, I believe, generally ap-

ingly sent from different parts by the side of the lumbar vertebræ, down to the groin, and upper part of the affected thigh; and, under this treatment, the contents of the abscess soon disappeared; nor did any further collection of matter take place during the time of her remaining in the house, which was nearly two months. The electricity also brought on the menstrual discharge, which for a long time had been very irregular; and her general health was greatly improved before she left the hospital.*

CASE IX.

Elizabeth Hart, about thirty years of age, had suffered greatly from pain in her loins, for ten months. During that time, matter had been formed, and made its way down beneath Poupart's ligament, in such quantity as considerably to distend the fascia of the thigh. She was much reduced in strength, and in the appearance of health, by this complaint; but as her constitution was good, and she could move the spine with facility, there was no reason to suspect any disease of the bone.

I punctured the abscess, and discharged two quarts of very healthy pus: and occasionally, after the orifice had closed, I ordered her emetics. She could not continue them regularly, however; as, during their use, her bowels became disordered,

plied to them,) were made by discharging a small jar, the coated surface of which did not exceed fourteen square inches: and by placing the ball of the electrometer at a small distance from the conductor, generally about a quarter of an inch. One of the discharging rods was then moved about on the upper part of the thigh, and the other on the loins, so that the electric fluid might pass through the abscess.

* I have lately heard, that the abscess has not appeared again, though a year has since elapsed; but the pain in her loins, has (as might have been expected) recurred.

and she lost her appetite and strength. The accumulation of matter was, notwithstanding, evidently delayed by them; for when, at the end of three weeks, I next punctured the abscess, only one quart of serous fluid was evacuated. After the space of a month had elapsed, another quart was discharged. During this time she had taken emetics occasionally; but her health was far from good, and the pain in her loins was still considerable.—I had now witnessed the beneficial effects of electricity in the case of the last patient, and resolved upon trying it here. It was accordingly employed three times a week, for three weeks. At first, a small collection of fluid in the abscess was perceptible; but this was gradually absorbed; and by the end of the third week, there was no longer any pain in her loins, her health was greatly improved, and she was able to walk about, without the least appearance of her former complaint. She was therefore discharged from the house; but came once a week, for some time, to be electrified.*

The two last cases point out to notice a remedy that is likely to be of much advantage in the future treatment of lumbar abscesses. My experience of it, however, has not yet enabled me to determine how far it may be generally beneficial. In one instance where I employed it after the abscess had been once punctured, it kept the matter from collecting for a long time; but the patient growing tired of the confinement, and apprehensive lest the lancet should be again employed, left the hospital without my knowledge.—Of another, and somewhat analogous disease, in which it was tried, though not with complete success, I shall here re-

* This patient remains at present in perfect health; nor is there any reason to expect a relapse.

late the particulars; first remarking, that all the observations which I have made on electricity applied to diseased parts, led me to conclude, that it acts as a stimulus, which has the peculiar effect of accelerating that process which happens to be going on at the time.—Thus, in some states of inflammation, it hastens suppuration, whilst in others it promotes dispersion. We should therefore always endeavour, previous to the use of this remedy, to bring the tumour or abscess into that state in which its progress is stopped, and in which, perhaps, it is rather inclined to recede; and by this rule I have been guided in the application of this remedy to lumbar abscesses.

I have also been attentive to proportion the number and strength of the vibrations to the effect which they appeared to produce on the abscess: their operation seemed to be most beneficial when they occasioned a kind of irritation or slight uneasiness in the part for a short time after their application. But if this sensation amounted to pain, or if it was of too long continuance, I then suppose that the stimulus had been employed in too great a degree.

## CASE X.

Israel Brooks, aged twenty-five, about two years ago, was first seized with violent pain in his loins, which prevented him from either riding or walking for some time. About three months afterwards, he had the rheumatism in the joint of one of his fingers, which shifted to his wrist, where it produced a thickening and disease of that part; and at present, all the carpal bones are evidently diseased, and displaced. This disease also attacked his left knee, where it occasioned an enlargement of the joint,

which still continues. Two months after this, he discovered a swelling beneath the glutæus muscle, which has gradually increased; and since that time the pain in his loins has become much less severe, but a sensation of great weakness remains. This abscess was shown to me at the hospital, as an instance of a remarkably large one; and there was no doubt but that it contained between two and three quarts of matter. There was also a prominence of the fascia on the front of the thigh below Poupart's ligament, accompanied with evident fluctuation. The several gentlemen, who examined this latter tumour, thought they could perceive an impulse given to it from within, whenever the patient coughed; whence it was supposed to have its rise from a lumbar abscess: but whether the abscess under the glutæus muscle communicated with the loins or not, we were unable to determine, as no such impulse could be felt in it.

I gave the patient emetics of vitriolated zinc and copper; and kept up an eruption of pimples on the skin covering the abscess, by rubbing it with a strong solution of tartarised antimony. Gentle electric vibrations were also daily passed from the loins through the front of the thigh, and also through the glutæal abscess. By this treatment, continued for two months, the tumour was very much reduced in size; that is, as far as could be judged of by the eye; for its situation prevented any accurate measurement of it. In spite of our endeavours, however, the patient's health had declined since his admission into the hospital; and in proportion as he lost strength, his other local complaints became worse. As it was now summer-time, and he had an opportunity of going to the sea, which had formerly been of service to him, I punctured the glutæal abscess without loss of time, let out three pints of

healthy pus, and then healed the opening. His weakness increased considerably after this discharge, and all his other complaints were much aggravated. The electricity was still persevered in; and at the end of three weeks, the quantity of matter in the abscess was very small; I cannot suppose it was more than eight ounces.—I very much wished to have had an opportunity of making fresh punctures in this case; but the state of the patient's health obliged me, however reluctantly, to discharge him from the hospital.

I have always found that abscesses, evacuated in this manner, filled again to one half or two thirds of their original quantity in the space of a fortnight: so that here also, the beneficial effects of electricity are, in my opinion, sufficiently manifest.

Of late years I have not, however, employed the measures pursued in the cases above recorded, but trusted altogether to such as seemed calculated to improve the health, by tranquillizing and invigorating the digestive organs. The result of such management has been, that, in general, the abscess has disappeared for a considerable time, after it has been two or three times punctured. After the lapse of some time, however, one of the punctures made for the discharge of the matter has unclosed, either with or without some trivial collection of fluid previously being formed in the cavity; and, I regret to add, that of late, in general, the disease thus circumstanced, has terminated fatally. Yet, I think, it will be admitted, that abscesses which open in this manner, open in a manner producing the least possible irritation to the constitution; and that the previous treatment, which they have undergone, has materially tended to diminish the risk commonly attendant on such diseases. I conclude

then by relating one case of lumbar abscess, treated in the manner which seems to me best, which terminated fatally, as an example of what, I fear, will be the frequent termination of such cases. I will add, however, several cases, to show, that lumbar abscesses, when open, are not necessarily destructive diseases, and to suggest the treatment which ought to be pursued under such adverse circumstances.

## *Of Lumbar Abscesses becoming permanently open.*

### CASE XI.

James White, aged twenty-five years, came from Essex to be admitted into St. Bartholomew's Hospital, on account of a lumbar abscess. He had suffered much from pain of his loins for twelve months; and for some time past had experienced a difficulty in lifting up his right thigh. There was a curvature in the dorsal vertebræ; but that, he informed me, was an old complaint. Yet, from the general appearance of the man, from the difficulty he had in moving the upper part of the trunk upon the lumbar vertebræ, and from the caution with which he attempted this motion, I could not but suspect a disease of the spine. Issues were therefore made in the loins; and on the 25th of June, I let out two quarts of purulent fluid from beneath the fascia of the thigh. He had less pain in his back after the operation: and though he was teased with a cough, his strength did not suffer any diminution.—On July 7th, I discharged from the abscess fourteen ounces more, of a turbid brownish fluid. On the

17th, though the tumour in the thigh was inconsiderable, yet the part first punctured was elevated and inflamed It seemed that the puncture in the integuments had healed, while that in the fascia had not united firmly, but had suffered the matter to pass through it, so as to elevate the skin. To remedy this, which threatened to lay open the cavity of the abscess, I was obliged to puncture it in another place; and eight ounces of fluid were discharged. The patient was now in much better health than he had been for more than a year, and was able to lift up his thigh without pain. I therefore set him to exercise the muscles in the neighbourhood of the disease, thinking that if the exertion did not produce irritation, it might answer a good purpose. With this view, he stood upon the leg of the sound side, and alternately lifted up and let fall the other, until he was somewhat fatigued. By frequent repetition of this exercise, the muscles of the diseased side acquired considerable strength; and in a little time he felt himself (to use his own expression) "able to go to plough."

The fascia of the thigh was punctured every fortnight for some time, and afterwards every three weeks. When he had been nearly three months in the hospital, he became tired of the confinement, and, feeling himself strong, was very solicitous to have the abscess opened, and suffered to discharge itself. The disease of the spine made me unwilling to comply with his desire; and I sent him into the country for three weeks, that he might ascertain, by the journey, whether he was as strong as he supposed; thinking that if he bore it without fatigue, it might be of service to him. At the same time, I gave him strict injunctions not to exert himself if his loins or thigh became painful; and, in that case, to return again by the first convey-

ance. It was five weeks, however, before he came back; when I found that the abscess had inflamed, and burst, about twenty days after he left town; in consequence of which he became so ill, that he could not bear removal. He was now in a most wretched condition, being scarcely able to turn in bed, from the weak and painful state of his loins; his pulse was rapid, and his skin hot, and he had occasionally fits of chilliness succeeded by sweating. He became considerably better, however, and continued so for some time, in consequence of the attention paid to him in the hospital; but his health again declined; and after several relapses, with intervals of temporary amendment, he at last sunk, and died at the end of three months from his re-admission.

On opening the body after death, I found that the abscess extended upwards to some diseased vertebræ. The diseased bone, however, did not immediately come into view on lifting up the peritonæum; for the tendinous expansion, which covers the bodies of the vertebræ, was still entire, and formed a kind of cyst distended with matter. When this was opened, it was found to contain pus, together with the fragments of three of the bodies of the lumbar vertebræ; there being ten or twelve detached pieces of bone lying upon the medulla spinalis, and surrounded with matter. This was evidently a peculiar disease of the spine, which neither caustics nor any other remedy could alter. It greatly resembled that diseased state which sometimes occurs in the carpus and tarsus, in which the small bones composing these parts are broken down, and lie confined in a ligamentous capsule, surrounded with matter. If the dead portions of the vertebræ had not been thus confined, they might have had some chance of removal; but under the circumstances already noticed, it is most

probable that they would remain, and act as extraneous bodies, exciting irritation, and increasing the disease.

## CASE XII.

*July* 1790. John Tucker was admitted into St. Bartholomew's Hospital on account of a Psoas Abscess. His health had been declining for more than three years. He had for a considerable time been an out-patient under the care of Dr. Austin, who had unavailingly endeavoured to prevent the formation of this abscess by issues made in his back, and by the administration of various medicines. He had suffered greatly from pain in his loins and fever: the abscess was very large and had descended very low on the inside of the thigh; the integuments covering it were natural; the impulse of matter into the tumour upon coughing very considerable.

His pulse was feeble and beat eighty-six in a minute; previous illness had exhausted his constitution; he had a constant cough, and undoubtedly much diseased lungs. He had little appetite, and was of a costive habit—he was of fair complexion, light hair, and blue eyes, and his countenance frequently flushed:—He was on all these accounts as unfit a subject, as can well be supposed, to encounter the derangement of constitution, which must succeed to the ordinary evacuation of the abscess.

On Wednesday the 28th of July, I tapped the abscess with a small hydrocele trochar, and discharged three pints of pus of good quality, although in a small degree more fluid than common. I dressed the part with considerable caution. I moistened

the lint which I applied to the orifice with tinctura benzoës composita, over this I applied some sticking plaster, which was retained by cross slips, and afterwards varnished over with gum; some compresses of linen were applied over the abscess, and gently bound on by a flannel roller.

On Thursday, there was no very perceptible difference in his health;—he had slept and eat as usual, his tongue was moist and natural, his pulse a few strokes quicker.

On Friday, he said, that he found his loins relieved by the evacuation, that he could perceive no difference in his health, and his pulse was the same as before the operation. For many days his health remained unchanged, he became he thought a little weaker, and the frequency of his pulse had encreased about four strokes in a minute. For this little alteration we could readily account, knowing that some fluids were drained from the circulation into the cavity of the abscess, and that some little exertion of the system would necessarily ensue. The abscess remained without pain or inflammation, and his constitution free from fever; his skin continued in its natural state, his appetite was good, his sleep sound, and his countenance unaltered. Three days after the operation I removed the dressings from the punctured part; it appeared healed; I however carefully renewed the dressings every third day.

Friday, the 13th of August, sixteen days after the first discharge, the tumour having become prominent, I again punctured it, and evacuated its contents. I knew the discharge would encrease his weakness; yet, if the collection were suffered to remain it would shortly distend the cyst to its former dimensions, and my original plan of treatment would be frustrated.

The quantity of the discharged fluid was nine ounces; in appearance and chemical properties it much resembled blood. This bloody effusion was probably the consequence of laxity of the exhaling vessels, as there had not been the least expression of inflammation in the abscess. Before I discharged the matter the second time he complained of some pain in his loins; but the following day he said he was much relieved, and found himself remarkably well. This second puncture was dressed like the former, and quickly healed.

During the time which had elapsed between the first and second discharge, he had not been confined even to the ward, but often went from the hospital to see his friends. This, his cough, the weak state of his health, his disinclination to live in the hospital, and the obvious impunity with which it was done, induced me to permit. After the second evacuation he altogether lived with his friends, promising to come every week to let me see the state of his complaint; however, the second week when the matter ought the third time to have been evacuated, he failed in his promise. I was now obliged to leave London for some time, so that I did not see the patient again until September the 8th, which was four weeks and five days from the former evacuation; he had refused to have the matter let out during my absence. I now discharged in like manner ten ounces of lymphatic exhalation, rather dark coloured and turbid, as if mixed with true pus. The man, during the last week, had complained of pain in his loins and in his knee, both of which were relieved as usual by the operation.

Before the abscess was first opened the impulse of matter from the loins, on coughing, was extremely forcible, but was now not at all perceptible.

It appears to me that a very considerable advantage is derived from this mode of treating these complaints. Whatever secretion is made in the abscess of the loins, will, by its gravity, descend into the space left by the seceded fascia of the thigh. The abscess of the loins being left perfectly free from distention will most probably contract to very little dimensions, if it be not perfectly abolished. Hence in the subsequent treatment of these complaints you have only to attend to the disunited fascia; whilst the cavity in the loins scarcely deserves notice.

September 22d, a fortnight after the former evacuation, I discharged four ounces of similar serous fluid mixed with pus. During its evacuation, which was very speedy, I had applied my fingers beneath Poupart's ligament, as if to obstruct the descent of any matter from the loins. I then desired the man to cough, but no matter descended, and the collection appeared to me entirely confined to the thigh.

I found some difficulty in introducing a trochar, when the abscess contained so little fluid. This was remedied by first introducing a lancet through the fascia, and then conveying the trochar through the aperture made by the lancet.

Thus after discharging the matter four times, the complaint was reduced from a lumbar abscess, containing three pints, to a small collection of matter beneath the fascia, containing four ounces.—What communication this had with the loins, and what was the state of parts there, cannot be determined. To appearance there was no collection. If I had now immediately opened the abscess, the containing cyst being small, the inflammation probably would not have been considerable. But the state of

the man's health induced me for a short time to defer this final attempt, this radical cure, as I may express it, and to be contented with only evacuating the matter when collected, without suffering the collection to increase the size of the cyst. It might be expected, by repeating the evacuation, that the cavity would diminish to its total abolition. This would probably happen were the abscess in the cellular substance; but the inelastic fascia cannot contract, and the subjacent muscles cannot be elevated, so that the effused matter, though very small in quantity, would still keep them disunited.

I had let out four ounces of matter once in October, and on the fifth of November I opened the abscess by an incision about an inch and a half in length at the lower part. I introduced my finger beneath the fascia as high as Poupart's ligament, I desired the patient to cough, but no matter descended from the loins, neither could I ascertain any communication. The extent of the detached fascia was about four inches and a half in length, and nearly four in breadth. The cyst inflamed after opening. The hardness and quantity of the discharge encreased for four days, and then gradually subsided. His thigh was stiff and sore, so that he could not easily move it, but he had no particular pain in his loins—his pulse did not vary—his tongue was not furred—his sleep was not interrupted—nor could any derangement of his health be perceived.

Granulations grew from the edge of the incision, and the opening nearly closed and afforded scarcely any discharge. Yet, on introducing a probe through the orifice, I found that the fascia remained disunited. With a view to produce an union, by ex-

citing inflammation, I introduced a seton from this lower orifice to the upper part of the cyst. The fascia again inflamed, indurated, and united, only the track of the seton was unclosed; and this by the injection of some spirit and water, was also soon induced to fill up. In discoursing with the patient, after opening the abscess, respecting his health, he said, he was ten times better than before it was opened; that until this time he had always been subject to fits of pain, and to a state of weakness and faintness which he could not describe.

After the perfect closure of the abscess, he could extend and bend his thigh with freedom and ease; he could also readily put his foot upon a chair set before him. This it would have been impossible for him to have done during the formation or continuance of the abscess. This freedom of action in the psoas muscle indicated considerable soundness of it, and of the contiguous parts. He still, however, complained of much rheumatic pain in his hips, and sometimes in his loins; and as I supposed his constitution might be affected by the suppression of a long-continued purulent discharge, and might attempt for its relief the formation of a new abscess, I inserted two setons in the integuments of the loins, with a view of preventing inflammation of the internal parts.

They did not, however, relieve his pains; he complained much of their inconvenience, and as he designed to go into the country, they were discontinued. I saw him about a year afterwards—no alteration had taken place in the thigh, nor no fixed pain had attacked the loins, but he was still much teased with unsettled rheumatic pains.

The preceding case was very unfavourable both from the patient's constitution and from the degree of the disease. Yet, by four times discharging the

matter, which was not attended with much more pain than bleeding, it was reduced from a lumbar abscess, containing three pints, to a small collection beneath the fascia of the thigh, containing four ounces, and without any evident communication with the loins. Each time, instead of suffering inconvenience, he experienced relief; he had no fever, neither was he restrained from his usual occupations.

The final opening might have been sooner made, but as this was the first case in which I had pursued this practice, I was uncertain of the event, and irresolutely protracted it for two months, in expectation of amendment of his health. When it was opened no perceptible fever followed, and it shortly got well by the treatment which I have related.

CASE XIII.

Isaac Dean, thirty-seven years of age, had come from Hampshire to London, to obtain advice for a Psoas Abscess. He was admitted into the hospital under the care of the late Mr. Pitts. The account which he gave of himself was, that his business had obliged him to be much on horseback; that he had formerly, when riding, bruised his left testis, which accident had occasioned an incurable disease of that gland; he therefore had suffered its removal about two years since in some county hospital. Since that time he had frequently suffered much pain in his loins; about eight months before his admission into the hospital he had caught cold: the pain in his loins then became more violent and constant, and much impeded the motions of his left thigh. About three months after this attack of severe pain, he perceived a tumour in the upper

part of his thigh, which had gradually increased until the time of his admission into the hospital. Since the appearance of the tumour, the pain in the loins had much abated. The matter now descended about four inches beneath Poupart's ligament; and it received a forcible impulse when the man coughed. The fascia of the thigh at this part was very prominent, and the skin covering it was more red than the rest of the integuments.

The patient's health was not unfavourable; his pulse was rather strong, beating seventy-six in a minute, his tongue rather pale, his hair and eyes dark.

Monday, 3d of October, 1790, by Mr. Pitt's desire I introduced a trochar into the lower part of the tumour, and gave discharge to twenty-four ounces of pus, moderately tenacious, and containing some flakes of firmer matter: I cautiously closed the orifice, as in the former case, applied a compress, and bound it moderately tight with a roller.

I could not in this case perceive any alteration in the man's health deserving to be recorded, except that the pulse was a little quickened: he eat and slept as usual.

I carefully took off the sticking-plaster at the end of three days, and renewed a similar dressing. On Thursday, 13th of October, the abscess was now again prominent, and the puncture made by the trochar seemed slightly inflamed. As I concluded the distention of the fascia caused this inflammation, and supposing that if the pressure of the matter from beneath was suffered to continue, it might occasion it to ulcerate, I determined to prevent this effect by again evacuating the matter. This I accomplished by passing a trochar into the lower part of the abscess, at some distance from

the former opening; and by this means discharged between eight and nine ounces of pus, thinner and rather darker coloured than the former, but not tinged with blood as in the preceding case. I now carefully dressed both orifices, and again applied a bandage.

I cautiously removed the dressings, at the end of three days; the second puncture had healed, and the first had lost its disposition to inflame. After having dressed the punctured parts, and applied the bandage, I desired him to moisten it with aq. saturn., which I thought by keeping the skin cool, would prevent its disposition to inflame. The man suffered no alteration in his health from this second evacuation. On the 25th, at the end of a fortnight, the tumour being again prominent, I introduced a lancet into the fascia, and, through the orifice thus made, the trochar, which discharged six ounces of turbid serous fluid, and I pursued the same subsequent mode of treatment.

After another fortnight had elapsed, the tumour was much less prominent than before, and there appeared a degree of irritation in the skin. The punctures showed a disposition to inflame. I now desired the man to cough, but could discover no impulse of matter from the loins. This I had not before done, lest the exertion should affect the punctures, which were not so firmly healed as in the former case. As the patient had not suffered much from discharge, as his health seemed fully capable of sustaining the effects arising from opening the abscess, as it was not probable that its dimensions could suffer further diminution by delay, on Friday the 23d of November, I opened the cavity by an incision of about an inch in length, at the lower part, and immediately passed

a seton through to the upper part, with a view to insure the union of the fascia.

An usual degree of inflammation of the fascia and stiffness of the affected limb followed, but he complained of no particular pain in his loins further than general stiffness. The slight fever which accompanied seemed rather inflammatory than hectical, his pulse became a little quicker and harder, and his tongue slightly furred. These symptoms gradually abated, and at the expiration of three weeks the fascia appeared to have adhered firmly to the subjacent parts: I therefore withdrew the seton.

As he now found his health tolerably good, and being, as he thought, recovered from what he considered as a dangerous complaint, and imagining that he was made weaker by staying in the hospital, he went into the country, promising to inform me if any change happened; but I have not since heard of him.

### CASE XIV.

February, 1791. James Leaver is in the 21st year of his age, has light brown hair, blue eyes, dilated pupils, pale countenance, frequently flushed, and is apparently of an irritable constitution. About nine months ago he was affected with a pain in his loins when he moved, which soon became very severe, even when he was at rest. This pain was accompanied with fever. Four months afterwards he perceived a small swelling in the upper part of his right thigh, which has since gradually increased, and has now descended nearly to the middle of the thigh: he remarked, that he never had the least pain in the part where the tumour was formed. After the appearance of this swelling, he no longer experienced

the same degree of uneasiness in his loins; and shortly after, he acquired the power of lifting up his right thigh, which he had for some time lost.

For four months previously to his admission into the hospital, he had regularly profuse night sweats, which began about twelve o'clock, but did not prevent his sleeping; when he awoke he found his clothes very wet, and himself very chilly; he had, however, an appetite for his breakfast.

On the 5th of February, Sir James Earle introduced a trochar into the most prominent part of the tumour: between two and three pints of healthy matter was evacuated, the wound was immediately closed, and lint and adhesive plaster were applied. The night succeeding the operation he slept little, but was free from perspiration. On each succeeding night he slept as usual, but had not in the least degree those sweats which had been constant until the discharge of the matter.

On the 8th of February, he said he found himself no worse for the operation, he was free from night sweats and slept soundly. His appetite was perfectly good, his bowels unaffected, and his tongue moist and florid. His pulse, before the operation, was ninety, and for fifteen days afterwards it varied between that and a hundred. February 15th, ten days after the evacuation, his night sweats returned, although in a less degree than formerly.

February 26th, three weeks after the first discharge, the tumour had now become nearly of its original size; the integuments were much distended; the part punctured by the trochar had for three days appeared inflamed; and on the tumour being now compressed, the cicatrix gave way, and the contained matter oozed from the orifice. The trochar was again introduced through the former orifice, and eight ounces of brownish matter discharged.

The wound was carefully dressed, in hopes that as the distention was taken off, it might close. After the second evacuation, the night sweats again ceased; he said, he was rather weaker, but no other alteration in his health was perceived.

On the 2d of March, while in the act of coughing, the imperfectly healed wound made by the trochar gave way. Very little pus was discharged, but as it was impossible to heal this ulcerated opening, and as the continuity of the cyst was now destroyed, the mode of treatment hitherto pursued was frustrated. Much inflammation of the cyst immediately took place, and the constitution became greatly affected. The next day, if the finger slightly compressed the abscess, it gave him great pain; but before the cavity of the abscess became exposed, the part was perfectly indolent. When pressure was employed, a fœtid, frothy matter issued from the ulcerated orifice. The cyst, however, was emptied, and, except when pressed, there was no discharge. Such were the appearances of the part. The general disturbance of the constitution was also very great; his countenance exhibited strong expressions of alarm; if any one approached him he started, and when any one touched him he trembled. His pulse beat from 130 to 140 in a minute—for two days his bowels were disordered—however, the inflammation of the cyst gradually abated, and in like manner the constitutional derangement subsided. At the end of about eight days, he was much amended, and in about six weeks the abscess appeared nearly well, and his constitution relieved from febrile indisposition.

In this case it is clear, that the second discharge of matter was too long delayed, and to me it appears equally evident that the patient derived much advantage from the mode of treatment which had been

pursued; for by it the complaint was reduced from a large abscess, containing nearly three pints, to one which held less than eight ounces. Yet, even in this diminished state, great derangement of the constitution followed the exposure of the cavity of the abscess: indeed, I have little doubt, if the abscess had been opened whilst it retained its original dimensions, but that the patient would have fallen a victim to the more extensive inflammation, and more violent fever which would then have taken place.

## CASE XV.

Elizabeth Ridley, aged fifty-five, had, for one year and a half before her admission into the hospital, suffered much from bad health; she then had a severe cough, accompanied with much fever. About ten months before she was admitted into the hospital, she had a very acute pain in her loins, which abated, in some degree, ten weeks after its first attack; at that time she observed a tumour in her groin, which had gradually increased in size. The pain had been continual, though at intervals it suffered considerable abatement: the veins on the fore part of the thigh had become varicous and the leg œdematous. The tumour was of a circular form, about four inches in diameter. It had much protruded the fascia, and matter was violently impelled into it on coughing. She now complained of occasional pain of her stomach, of failure of appetite, and a costive state of her bowels; her pulse was slow and feeble, her tongue pale, and her health considerably beneath the natural standard.

On the 8th of November, I punctured the lower part of the tumour with a lancet, carrying it obliquely about half an inch between the skin and the fascia, and discharged eleven ounces of good pus,

but did not empty the abscess. The orifice of the skin and cyst did not then correspond, and on coughing there was still perceived a considerable impulse of matter from the cavity in the loins. I was unwilling to irritate the cyst by the introduction of any instrument to separate the lips of the wound, therefore I closed the orifice with sticking plaster, and every thing remained quiet till the third day, when, by a fit of coughing, the orifice was burst open and matter oozed from beneath the plaster. If I suffered it to remain open, my original plan of treatment would be frustrated. I therefore resolved to let out the collected matter, lest distention of the fascia and integuments should prevent the wound from healing. I again introduced the lancet through the same orifice, and wounded it so as to make it bleed and give a discharge to five ounces of pus; the abscess, however, did not even now appear to be completely emptied.

The woman suffered no evident alteration in her health, but became much easier with respect to her loins. The varicose veins and the œdema of the leg now no longer appeared. These symptoms, doubtless, originated from the pressure in the loins, occasioned by matter, of which it was very evident there was a large collection.

On the 18th, the tumour was again punctured and eight ounces of fluid evacuated. The matter before had been incompletely discharged; now I believe the tumour was entirely emptied. This last discharged matter was perfectly inodorous and the thigh uninflamed. I made this aperture at the side of the tumour with the edges of the lancet held upwards and downwards, and not transversely as the former openings had been made. This I did that the efforts employed in coughing might have less effect

in impelling the matter through the orifice, which soon healed.

In the following week she complained that she was restless and could not sleep, neither had she her usual degree of appetite; her pulse, however, was not quickened, nor did any other signs of constitutional indisposition appear. No matter was now collected beneath the fascia, and after waiting another week without any apparent collection being made, on the 25th of November I introduced a lancet through the fascia of the thigh, with a design to leave the cavity of the abscess permanently open. I did not perceive any matter issue from the opening. As the integuments covering the fascia were thickened and showed some disposition to inflame, I directed the aqua plumbi acetati to be applied to them. On the following day some matter flowed through the orifice. The patient supposed, if collected, it might be a table spoonful; nearly the same quantity continued to discharge for about a fortnight, and afterwards it gradually diminished, and the wound healed. She was not affected by fever in consequence of this last opening, and seemed to suffer very little inconvenience with respect to her health. She, however, complained much of pains resembling those of the rheumatism, which affected principally her hips, though sometimes they attacked her loins; for these pains she was placed under the care of the physician, and as her constitution was languid, she was recommended to continue the medicines prescribed for her as an out-patient.

In this case one circumstance appeared to me curious; after I had twice discharged the contents of the abscess, no farther collection of matter took place. Yet not because the cavity of the abscess was abolished, but because from some little indisposition of the constitution the secretion into that cavity

was for a time suspended. This, however, was rather an advantageous circumstance, for as the cyst was empty, the contraction of the sides was unopposed.

### CASE XVII.

Charles White, thirty-six years of age, and not unhealthy, had a lumbar abscess, which presented beneath the fascia of the thigh, and which there was no reason to suppose connected with any disease of the spine. From this abscess I discharged, by puncture, twenty-four ounces of healthy pus, and healed the orifice. The patient suffered some weakness and derangement of health; but they were not considerable. The operation was repeated every fortnight; and, by the fifth time of performing it, the quantity had decreased to four ounces. At the end of another fortnight, I made the opening to discharge the matter, larger than common, and did not attempt to unite it, but directed a poultice to be applied to the thigh, and the patient to be kept in bed. No perceptible derangement in his health took place in consequence of this. The lips of the wound granulated, which, I think, is always a good sign; the fascia seemed to adhere to the parts beneath; and in the course of a month he was thought well enough to leave the hospital, although there was still some matter discharged from the wound. In a few weeks more, the part was entirely healed; nor had he afterwards any return of the complaint.

### CASE XVIII.

William Hankes, when about twenty-eight years of age, had a collection of matter formed in his loins, which descended beneath Poupart's ligament, and

elevated the fascia of the thigh. The formation of this matter had not been attended with pain; neither were the motions of the thigh impeded during its collection. The elevated portion of the fascia was about three inches in length, and two in breadth; and the impulse communicated to it from the loins, on coughing, was distinct, though not very forcible. I punctured the abscess, and discharged twelve ounces of pus, in which there were some flakes of coagulum. The wound healed speedily, and the patient not only suffered no inconvenience, but even found himself better than before the operation.—After three weeks' time, the matter which was collected gave so little prominence to the fascia, that, when I punctured it, I was apprehensive of injuring the subjacent parts; and not more than between five and six ounces of pus flowed from the orifice on this occasion. As the quantity of matter contained in the abscess at first was small when compared with that in many other cases which terminated well, as the patient also was young, and apparently capable of sustaining the degree of irritation likely to ensue, I thought there was no great risk in leaving the orifice unclosed. Accordingly, a poultice was applied over the part; and I hoped that, by thus endeavouring as much as possible to lessen inflammation about the wound, I might prevent any considerable degree of it from taking place in the cyst. For some time the fascia felt sore, and was painful when the integuments were pressed; but this tenderness abated in about ten days; the discharge also lessened, and there appeared ground to hope that the patient would soon get well. He was now attacked with pain in his loins, accompanied by fever: the discharge also increased, and had a fœtid smell. These symptoms, however, gradually abated, but left the patient greatly reduced in strength. After a

short interval, he again experienced a similar relapse and recovery, by which his weakness was still farther increased. He had been occasionally troubled with cough, which now became very constant, but without any expectoration; and I observed that he drew in very little air when he inspired.—As the abscess discharged largely, and the strength of his constitution was rather declining, I made a large issue in the integuments of his loins, with a view to lessen the internal disease. This seemed to be of great service; for the pain of his loins went off, and the discharge from the abscess abated gradually, and at last became inconsiderable. Still, however, he did not recover his health; and the country air was now recommended by Dr. Latham, who had prescribed for him, during his illness, those medicines which his disorder seemed to require. He accordingly left the hospital, and, at the end of ten months, returned to town; when the wound in his thigh still continued to discharge a small quantity of matter. Afterwards, a thickening of the integuments on the front of the thigh took place; and two or three small ulcers formed there, which did not readily heal, but were sometimes in a better and sometimes in a worse state.—I saw him occasionally, for two years, during which time he had tried the effect of sea-bathing. His health, however, was not good, though it did not appear to me to suffer from the remains of the abscess, which neither occasioned pain, nor hindered his walking. At last, his strength declining, he was again admitted into the hospital, under Dr. Latham's care. He was now much troubled with cough, and hectic fever; and, under the fascia of the other thigh, opposite to the dorsum of the ilium, a fresh abscess appeared, which, however, had no communication with the abdomen. The powers of his constitution were now evidently broken, and he gradually sunk, and died.

Being greatly hurried during the only opportunity I had of inspecting the body, my examination of it was very cursory. I can, therefore, only say that both lungs were irregularly and generally indurated; that the cavity of the original abscess still remained opened, but was contracted into a narrow fistula leading from the thigh to the middle of the psoas muscle. There was another large abscess on the opposite psoas muscle, which had not yet descended to the thigh, where, as has been already mentioned, there was also an abscess of considerable magnitude, but unconnected with this in the loins. The lumbar vertebræ were perfectly sound.

That the death of this man was not owing to the original abscess in the loins, is to me very evident. That abscess did, indeed, for a considerable time, greatly disturb his constitution; but it afterwards became indolent, and acquired a state incapable of exciting irritation.

## CASE XIX.

Having unfortunately lost the minutes which I took of the next case that occurred in the hospital, I can only give such a general account of it as my memory supplies. The subject of it, Doods King, who was under the care of Mr. Blicke, was about thirty years of age, and of a very sickly aspect. The abscess presented beneath Poupart's ligament; it contained at first about twenty ounces of curdly matter, and was punctured four times, with the usual progressive reduction in the quantity of matter discharged: but before the fifth time of opening, one of the punctured places ulcerated. There was indeed, from the beginning, in this case, a great disposition in the skin to inflame and ulcerate, and it

was with difficulty I could heal the orifices made to let the matter out. As soon as the cavity had thus become open, a poultice was applied to the part, and confinement to bed strictly enjoined. The patient became somewhat weaker, but no fever ensued. I did not suffer him to go about, however, for a long time, lest the motion of the parts should induce inflammation. The abscess at last became perfectly indolent itself, and un-irritating to the constitution; but it did not show much disposition to heal.—He was discharged in this state, and promised to apply again if his complaint became troublesome. I saw him about a month after his dismission, when he mentioned a design of going into the country; since which I have not heard of him.

### CASE XX.

Catharine Vallance, nineteen years old, of a healthy appearance, but having a considerable inclination of her body forwards, from a former disease of the dorsal vertebræ, had, for twelve months before I first saw her, laboured under severe pain of her loins, accompanied with fever. There was at that time a large lumbar abscess, the matter of which had descended to the upper part of the thigh, where it distended the integuments, so as to render them prominent and thin. A surgeon pricked this tumour with a lancet, and let out more than a pint of very healthy pus; by which the bulk of the swelling was scarcely diminished: but as no more matter would flow, a piece of sticking-plaster was applied over the orifice. Four days afterwards, another surgeon, observing that the integuments were inflamed, and the punctured part much disposed to ulcerate, made another aperture, at some distance from the former, and discharged three pints of good pus; which completely

emptied the cavity. The last puncture being attentively closed, healed readily, and the first lost its disposition to ulcerate. The young woman continued perfectly in health for ten days, when some little distention of the abscess again occurring, the first puncture ulcerated; in consequence of which the collected matter made its way out, and left a permanent opening into the cavity. Considerable fever now came on, the patient's pulse was rapid, her tongue white, and her skin hot and dry; but these symptoms abated after a short time, and she again recovered her former state of health; the abscess not falling into any secondary state of disease after the inflammation went off; nor did any hectic fever take place after the first derangement of the constitution had subsided.

Another abscess now presented itself, in the same situation, on the opposite side. As soon as this had acquired sufficient prominence to give security to the parts beneath, it was punctured; twelve ounces of healthy pus were let out, and the orifice was closed. When the matter collected again, the wound, made to discharge it, was suffered to remain open. The inflammation which took place in the cyst in consequence of this, was very slight, and hardly affected the constitution: the parts soon became indolent, discharging but little matter, and both the abscesses healed gradually.

It is now three years since that case occurred; and I have lately seen the patient, who has experienced no inconvenience from the complaint since that period.

## CASE XXI.

A young woman had a lumbar abscess presenting in the upper part of the thigh, from which a surgeon

discharged, by puncture, nearly a quart of matter, and healed the opening. At the expiration of a fortnight, a second puncture was made, and twelve ounces of matter let out. The last orifice was closed like the first, but after a few days it ulcerated, and the cavity of the abscess became exposed. The patient now growing very ill, was admitted into St. Bartholomew's Hospital. Her pulse was weak, but not deficient in strength; her tongue white, and her skin hot and dry: the discharge from the abscess was not great, but the pain of her loins was very severe. A large poultice was applied to the thigh; and the common saline mixture, with small doses of antimonials, was given. In the course of a week, a considerable change took place; her pulse, though still quick, was rather feeble; her tongue moist, and not furred; and she had frequent perspirations without any evident cause: the pain in her loins abated considerably, and the discharge from the abscess became copious, thin and fœtid. She now began to take the Peruvian bark, and in the space of a month gradually recovered from this state of debility. Having acquired strength enough to sit up, and to walk a little about the ward, she one day imprudently went into the air, and walked until she was much fatigued. The consequences of this were, a return of the pain in her loins, with quickness and hardness of her pulse, white tongue, and hot and dry skin. As the pain and fever went off, they were succeeded by an increased discharge from the abscess, and irregular perspirations, which gradually abating, the abscess at length became indolent, and no longer affected the constitution. Warned by her former experience, she now took exercise very cautiously; and when she found she could bear motion without exciting irritation in the abscess, she went into the

country, where she regained her health; the abscess healed, and she has since continued perfectly well.

When a permanent opening is made in a lumbar abscess, the part generally falls into a morbid state, and this is accompanied by a sympathetic affection of the constitution, corresponding in its nature with the local complaint. In the first of the two cases just now related, both the local and constitutional disease were of a more purely inflammatory kind, than in any other that I had ever seen; nor was it succeeded by that ill-conditioned state of the sore, accompanied with a thin fœtid discharge, and hectic symptoms, which so frequently occur in this disorder. In the second case, as the patient's general health was tolerably good, the disease in the beginning approached to the nature of common inflammation, then gradually acquired the usual state of these abscesses, but afterwards became indolent; the sympathetic affection of the constitution exactly corresponded to the state of the abscess. At first the fever was inflammatory, then hectical; and when the local complaint became indolent, the general state of the patient's health was no longer affected. These circumstances still more strongly appeared after the accidental re-excitement of the inflammatory symptoms.

In order further to confirm the foregoing opinions, I may add, that I have known a considerable space of time elapse, between the first bursting of a lumbar abscess and its assuming that morbid state which is so peculiar to those diseases, and which produces a corresponding affection of the system in general.

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